An Evaluation of the Wolf Ridge Student Teacher Program: Past Participants' Perspectives

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Abstract

The Wolf Ridge Student Teacher Program (WRSTP) has been in existence since 2004, yet no evaluation has been conducted regarding the potential impacts on participants who have completed the program. Through interviewing eight past participants with experience teaching within the formal classroom, this evaluative study investigated the influence of the WRSTP on instructional methods utilized and the inclusion of several aspects of environmental education into their formal environments. The common and relevant themes that emerged included: participants utilizing aspects of environmental education in terms of experiential and social learning; school culture significantly influencing how teachers utilized program components; and a shifting outlook on formal and non-formal education after program completion. Overall, the WRSTP has been effective in terms of offering guidance in instructional methods used to teach aspects of environmental education in the formal setting. Recommendations for the WRSTP were provided, and areas for future research were noted.

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Chapter One. Introduction

Background and Setting

In cooperation with the U.N. Environment Programme (UNEP), United Nations Educational, Scientific, and Cultural Organization (UNESCO) organized the world's first intergovernmental conference in Tbilisi, Georgia. The Tbilisi Declaration (UNESCO, 1978) created a framework and stated objectives for *environmental education,* which still guide the direction in the field today (NAAEE, 2005). Three general objectives that provide the foundation of what has developed in the field of environmental education since 1978 (NAAEE, 2004) are as follows:

- To foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment;
- and to create new patterns of behavior of individuals, groups, and society as a whole towards the environment (UNESCO-UNEP, 1978, p. 26).

Creating new patterns of behavior within individuals, groups, and society towards the environment requires time and continuity of knowledge and skills. Developing the knowledge, values, attitudes, commitment, and skills of current and future citizens will require a liaison that also recognizes these same attributes as a vital component within environmental education. This liaison can come in many forms, but the role of a formal classroom teacher is pivotal in supporting these goals and in the development of an environmentally literate citizenry. The preparation of these formal classroom teachers can

serve as a vital link in changing how we teach environmental education (Archie, 2009; Bodzin, 2010; Gardner, 2009) and work towards realizing the goals stated in the Tbilisi Declaration.

Currently, the incorporation of environmental education into the formal classroom varies from one classroom to the next. The challenges of integrating environmental education vary according to the teacher, the classroom context, and the overall school environment. Ham and Sewing (1988) have labeled these assorted challenges as either "conceptual barriers" or "logistical barriers." Examples of conceptual barriers would include a teacher's perceived lack of competence incorporating environmental education into an interdisciplinary curriculum or their perception that environmental education fits only within a science curriculum. Logistical barriers would include lack of time, lack of instructional materials, lack of funding, and lack of training (Ham & Sewing, 1988). Although many teachers reported an overall positive attitude towards environmental education, many stated a lack of commitment to teach and include environmental education within their curriculum due to these barriers (Ernst, 2007; Ham & Sewing, 1988; Lane & Wilke, 1995; Simmons, 1998).

Another conceptual challenge is exactly where and how to integrate environmental education within schools - which has contributed to a variety of approaches (EETAP, 2004). environmental education, when taught in school settings, has been typically integrated into a school's science curriculum (Bodzin, 2010; Drzewiecki, 2005), and therefore to help pre-service teachers learn about environmental education, some universities use their science methods courses to offer an environmental education component via theory or practice. A variety of approaches within these courses have been

used to introduce pre-service teachers to environmental education concepts such as a) one or more outdoor field trips each semester, b) introducing curriculum resources that relate to environmental education (for example Project Learning Tree, Project WILD, or Project WET), c) opportunities to simulate teaching outdoors with their cohort or actual children, and d) using the local community as an opportunity to introduce service-based education (Bodzin, 2010; Drzewiecki, 2005; Powers, 2004). While providing pre-service teachers with opportunities to experience environmental education, this may serve as a potential drawback where many pre-service and in-service teachers associate environmental education as science-related only rather than integrated across curriculum into other content areas (Ernst, 2007; Van Petegem, 2005; Wade, 1996). This lack of consideration of environmental education as an interdisciplinary approach across multiple subjects, even in pre-service teacher training programs, can lead to the belief that environmental education should only be taught within the science curriculum. Indeed, survey results of in-service teachers and their perspectives of professional development concluded, "environmental education is dominated by activity-based, nationally produced curricula; is primarily science-oriented rather than interdisciplinary; and is concerned more with environmental content than educational context" (Wade, 1996, p. 1). This perspective serves in contrast to the original goals and principles of the Tbilisi Report Recommendations set in 1978, which state "environmental education is inter-disciplinary and holistic in nature and application; and is an approach to education as a whole, rather than a subject" (Palmer, 1998, p. 10). "environmental education's reform potential can be realized if one believes environmental education to be more than a mere emphasis on the ecological and human/environment aspects of existing science and social science.

environmental education could be described as a comprehensive educational reform effort" (Wade, 1996, p. 7).

Using the goals for environmental education outlined in the Tbilisi Declaration as a guide, and the recognition of teachers as critical agents toward accomplishing them, the North American Association for environmental education (NAAEE), created the *Guidelines for the Preparation and Professional Development of Environmental Educators.* These guidelines aim to "provide a mechanism for gauging the quality of pre-service and in-service preparation programs and the abilities of environmental educators" (NAAEE, 2005, p. 1). In recent years, several teacher preparation programs offered by universities have begun to include environmental education as part of their program curriculum for preparing pre-service teachers, using the *Guidelines for the Preparation and Professional Development of Environmental Educators* as a guide for their development. The level of university participation in utilizing these guidelines varies from one university teacher preparation program to another, as currently there are no nationally recognized teacher preparation education standards specifically for environmental education.

Similarly, the National Council for Accreditation of Teacher Education (NCATE), now the Council for Accreditation of Educator Preparation (CAEP), is one institution that sets expectations in the form of standards for university teacher preparation programs to follow when preparing formal educators. When designing a specialized teacher preparation program such as the inclusion of environmental education, a university teacher preparation program has the option to follow the standards set by NAAEE, as long as CAEP standards are also followed. For example, the guiding

principles set by NAAEE for developing environmental educators in both formal and non-formal settings led NCATE in 2007, to adopt these environmental educator preparation standards set by NAAEE; and "environmental education became one of 20 'special program areas' in which schools, colleges, and education departments choose to be accredited" (Archie, 2009, p. 7). Currently, CAEP is reviewing new environmental education program standards for teacher preparation programs. These standards were submitted by NAAEE in 2015.

Some states do recognize the need and have used these sets of guidelines to prepare teacher candidates in environmental education before entering into the educational field. For example, the revised Wisconsin Administrative Code Chapter PI 34 Teacher Education Program Approval and Licenses (DPI, 2000), requires institutions of higher education to prepare teachers to address all state standards, including the Wisconsin Model Academic Standards in environmental education. Therefore, universities in Wisconsin require all teachers to participate in environmental education as a condition of licensure (Wisconsin Department of Public Instruction, 2015). According to the Wisconsin Department of Public Instruction under the institutional and program standards, candidates participating in a teacher preparation program must demonstrate knowledge and understanding in environmental education and conservation of resources before they can obtain teaching licenses in agriculture, early childhood, middle childhood, science and social studies (Wisconsin Department of Public Instruction, 2015). Before candidates receive licensure, they must pass all state requirements, including courses in environmental education (Wisconsin Department of Public Instruction, 2015). Additionally, the *Guidelines for the Preparation and Professional*

Development of Environmental Educators set by NAAEE offer guidance in developing program standards for these Wisconsin teacher preparation programs (Ashmann & Franzen, 2015).

While Wisconsin offers environmental education within their teacher preparation program to obtain teacher licensure, the state of Washington uses a different approach to teacher preparation in environmental education. Several state universities within Washington offer environmental education learning opportunities through environmental education certification. As of 2009, Washington offers separate endorsements within teacher education programs for environmental education, approving a new Specialty Area Endorsement in Environmental and Sustainability Education (ESE) in certain universities and professional organizations (State of Washington, n.d.). Synthesizing guidelines set by both NAAEE and the environmental education Association of Washington, this licensure is offered to both formal and non-formal educators (ESE Professional Development Guidelines, 2010). It was created to promote leadership possibilities for pre-service teachers and offer opportunities to learn interdisciplinary methods (State of Washington, n.d.). Washington and Wisconsin are just two states that demonstrate varying types of environmental education models that have been created by university teacher preparation programs.

In addition to addressing the logistical and conceptual barriers, it is also important to consider the teacher as an individual, and how that teacher may teach is greatly influenced by a large number of variables. Teaching practices and behavior exhibited in the classroom contribute to the whole of the teacher as a person, and is termed "teacher identity" (Flores, 2005; Korthagen, 2003). The way a teacher may approach a topic is

dependent upon many variables, including contextual factors within the school and past influences and experiences. The contextual factors of a current teaching environment include classroom practice, school culture, and leadership within administration, which all play a major role in the way a teacher may teach (Flores, 2005). In addition to contextual factors, past influences that include personal history, initial teacher education programs, and teacher practices can aid in the development of current practices and behaviors in the classroom (Flores, 2005).

Concerning the influences to teacher identity and current teaching practices, Korthagen (2003) gives a greater emphasis on the core qualities of an individual - the character traits and values a person may have serves as a great influence on teaching behaviors and practices. Classroom teaching practices will be based on contextual factors and teacher identity; and that level of commitment to teach certain subjects through various methods is largely dependent upon the individual.

Knowing that contextual factors, including an educator's initial teacher education program, and personal teacher identity may influence the way a teacher may teach, various pre-service teacher preparation programs within the United States - including the examples from Wisconsin and Washington (Archie, 2009) - have developed various ways to promote the knowledge, skills, and attitudes that may be needed to overcome the challenges associated with integrating environmental education into the classroom (NAAEE, 2005). However, a national survey conducted within 715 teacher education institutions found that only half of the surveyed students in pre-service programs received exposure to environmental education (Bodzin 2010; McKeown-Ice, 2000). Similarly, another study found that "10% of teachers have taken courses in environmental education

as part of their pre-service preparation program" (Ernst, 2007, p. 16). Lane and Wilke (1995) reported that teachers who participated in the mandated certification program were pleased with their environmental education courses, but less pleased with the direction of how to incorporate the content into their classroom. A major difficulty for universities is balancing between the call for increased disciplinary content into teacher preparation programs, and pedagogy, philosophy, methods, and management courses where multidisciplinary education could be taught (Disinger & Howe, 1990). Unfortunately, the latter tends to fall short because of this increased emphasis on content (1990). In essence, many teachers are finding it difficult to incorporate environmental education due to decreased attention to teaching strategies and instructional approaches.

Addressing environmental education as a holistic and inter-disciplinary component of preparing pre-service teachers that supports a wide range of instructional strategies, promotes a connection to the environment through experiential learning, and is not solely focused content, is a challenge. University teacher preparation programs will range in the type of programming offered and vary in the use of methods regarding environmental education content and approaches. A focus on experiential learning is offered from the perspective of two common types of programs - the internship and practicum (Eyler, 2009). Both are supervised discipline- and career-related work experiences that involve learning by doing, critical reflection, and professional development (Simons, et. al. 2012).

One current program that is working to address these challenges is the Wolf Ridge Student Teacher Program (WRSTP), based in Finland, MN at Wolf Ridge Environmental Learning Center. This teacher preparation program has been in existence

since 2004, where pre-service teachers from regional universities have completed their student teaching practicum in their final year of their undergraduate teacher preparation program. The WRSTP consists of thirty-six weeks total; ten weeks of teaching experience within a formal education setting of a traditional classroom, and twenty-six weeks of teaching experience at a non-formal residential environmental learning center using the outdoors as the educational setting. The intent of the WRSTP is to give pre-service teachers the tools and strategies to bridge the outdoor settings and the traditional classroom. In this way, K-12 students of these future educators are offered the opportunities to explore learning within these different educational settings, and future educators can practice a diverse range of instructional approaches within both settings. Using the concept of authentic experiences through direct observation of the natural world, pre-service teachers learn the value of providing opportunities for experiential-based education both within the classroom and outside the classroom (Hammerman & Hammerman, 1985).

In the WRSTP, student teachers are exposed to different instructional approaches concerning environmental education and practice these approaches in both formal and non-formal settings with K-12 students. The WRSTP can be divided into separate teaching settings: 1) student teachers participate in the 26-week non-formal education method and practice while at Wolf Ridge Environmental Learning Center, 2) then transition into the 10-week teaching practicum in the formal classroom.

With a framework centered on experiential learning while at Wolf Ridge Environmental Learning Center, and under the supervision of educational staff, student teachers learn non-formal curriculum content and approaches to teaching environmental

education by participating in the lessons first as a K-12 student might experience the lesson. Then, the student teacher steps into the role of non-formal educator and teaches the lesson to K-12 students. In this way, student teachers learn to consciously adapt the lessons throughout the year to fulfill learning objectives for visiting K-12 school groups and students. environmental education topics vary, with core competencies centered in adventure education, cultural history, environmental issues, and ecology. These core competencies are integrated within 50 three-hour lessons geared toward students from various age levels.

The Wolf Ridge Student Teacher Program starts with a two-week training period where student teachers experience the lessons from a student and teacher's perspective, learning how to harness the instructional strategies and tools used by staff within each lesson through direct experience. Eventually, they will adapt these strategies to their own teaching practices throughout the academic year. These strategies typically include hands-on, exploratory investigations through diverse activities aligned within the different lesson topics. Through experiential education, the educator acts as facilitator, promoting reflective questions of environmental values with the focus not only on cognitive learning but affective learning as well. Emphasis is placed on reflection and self-applicability throughout the lesson to derive personal meaning from the learning experience for the students. By modeling engaging, reflective, inquiry-oriented activities for student teachers to incorporate within their classes at Wolf Ridge Environmental Learning Center, facilitators of the Wolf Ridge Student Teacher Program can encourage student teachers to provide opportunities related to inquiry for future students within the formal classrooms.

In addition to non-formal classroom practice, active reflection occurs weekly through staff, peer, and self-evaluations. Professional development is offered throughout the year by way of additional opportunities of expanding knowledge in environmental education content, methodology, and skill development. Experiential learning is central to the Wolf Ridge Student Teacher Program, where "…teachers need to have opportunities during their teacher education programs to instruct and interact with children in similar settings to which they will be teaching" (Carrier, 2009, p. 43).

Student teachers transition to ten consecutive weeks within their formal classroom placement, which offers these teachers opportunities to apply the instructional approaches learned from the non-formal setting to the formal classroom. Within this portion of the program, student teachers fulfill requirements set by state licensing requirements by "demonstrating an understanding for the central concepts, tools of inquiry, and structures of disciplines taught and be able to create learning experiences that make these aspects of subject matter meaningful for students" (Revisor of Statutes 8710.2000, 2009, p. 1). To fully assess the formal classroom performance and practice of student teachers, it is now mandated for student teachers gaining licensure in the state of Minnesota to complete the Educator Teacher Performance Assessment (edTPA). Created by Stanford University and adopted by over 600 teacher preparation programs in 40 states, "edTPA is a performance-based, subject-specific assessment and support system used by teacher preparation programs throughout the United States to emphasize, measure and support the skills and knowledge that all teachers need from Day 1 in the classroom" (edTPA, 2016). Student teachers "must prepare a portfolio of materials during their student teaching clinical experience. edTPA requires aspiring teachers to demonstrate readiness to teach through

lesson plans designed to support their students' strengths and needs; engage real students in ambitious learning; analyze whether their students are learning, and adjust their instruction to become more effective. Teacher candidates submit video recordings of themselves at work in a real classroom as part of a portfolio that is scored by highly trained educators" (edTPA, 2016). Thus, student teachers participating in the WRSTP are encouraged to promote hands-on, interactive approaches within lessons, engaging their K-12 students in making connections to the natural environment.

After the ten consecutive weeks of teaching in the formal classroom is completed, the student teachers transition back into the role of non-formal educator at Wolf Ridge Environmental Learning Center to finish their full of student teaching. Therefore, within one academic year, the student teachers have the opportunity to teach 2,500 different visiting students from schools across Minnesota within the non-formal education setting, in addition to teaching for ten consecutive weeks in a formal classroom setting with the same grade-level students. By extending the teaching and learning process into instructional settings beyond the classroom, the teacher can provide greater opportunities for understanding content that is normally discussed, but rarely experienced by student teachers (Hammerman & Hammerman, 1985). In addition, student teachers have greater opportunity to demonstrate competence in demonstrating environmental education content within the curriculum - one of the conceptual barriers mentioned by Ham and Sewing (1988).

Pre-service teacher preparation programs that include non-formal environmental education can provide new teachers with the instructional strategies necessary to implement interdisciplinary content. Through participation in this program, these formal

classroom teachers may be able to harness the skills, abilities, knowledge and resources needed to integrate environmental education concepts into school curriculum (Bodzin, 2010; Hammerman & Hammerman, 1985). As the goal of the WRSTP states, "The program aims to develop quality formal educators that understand how to bridge the current gap between formal and non-formal classroom settings and are dedicated to being leaders in their communities" (See Appendix A).

Purpose of Study

This evaluative study investigated the outcomes and potential impacts of the Wolf Ridge Student Teacher Program by participants who are currently teaching or have had experience teaching within the formal education system. Through interviews, this evaluative study explored the various instructional approaches utilized within the formal classroom by these participants. As the aim of the Wolf Ridge Student Teacher Program is to bridge the gap between the natural world and the traditional classroom through varied methods of teaching, these educators were asked to share their story of the classroom, their role, and the current approaches to environmental education. Potential challenges to bridging this gap were also explored. Through this study, findings were applied to guide future programming and effectiveness, and also gave further support in current programming processes.

Research Questions

The following questions guided this evaluation:

1)What teaching and working experiences have past participants held since leaving the Wolf Ridge Student Teacher Program?

2) How do past participant perceptions on program outcomes of the Wolf Ridge Student

Teacher Program compare with stakeholder perceptions?

3) How does the experience of participation in the Wolf Ridge Student Teacher Program influence participant perspectives as they relate to educational elements that include the learning environment, curriculum, teaching practices, and perceptions of environmental education?

4) How have participants used or advocated for the use of program components within their formal classroom experiences?

Significance Statement

As the goal of the Tbilisi Declaration (1978) is to create new patterns of behavior within individuals and society by developing knowledge, skills, and attitudes specifically for the care of the environment, the role of the formal classroom teacher is a fundamental link in developing younger generations of environmentally literate citizens. How these future formal educators are taught to incorporate environmental education into their classroom will vary from one teacher preparation program to the next. But as environmental education guidelines set by national organizations, such as NAAEE, continue to evolve, pre-service teacher preparation programs that incorporate environmental education into their teacher preparation programs must address the challenges of implementing environmental education into the formal classroom. Recognizing environmental education as a crucial component of K-12 student's education that is grounded in experiential learning is the first initial goal, but is also another challenge among university teacher preparation programs.

The Wolf Ridge Student Teacher Program is one program model for teaching pre-service educators strategies of integrating environmental education. An evaluation of the

program from the perspective of the participants after they have had experience teaching in the formal classroom had not yet occurred. By interviewing the participants who have completed the Wolf Ridge Student Teacher Program with teaching experience in the formal classroom, this evaluative study attempted to provide insight into the effectiveness of the WRSTP towards meeting its intended goals and provide recommendations for future consideration.

Limitations of the Study

1. All data is dependent on one interview source.
2. Because all data is self-reported from the perspective of the participants interviewed, the evaluator can only speculate what teaching strategies are utilized in the participants' classroom.
3. The evaluator did not cross-check the data analysis with another person to check for inter-rater reliability.
4. Potential evaluator bias may be present as the evaluator graduated from the Wolf Ridge Naturalist Training Program in 2013, a program that is closely related to the Wolf Ridge Student Teacher Program.

Definition of Terms

Formal Education

Nominal: Because the term 'Formal Education' is broad, it is defined in separate parts according to Minnesota Legislature, Office of the Revisor of Statutes. 'School' is defined as an accredited public, private, or charter institution with regular student attendance (Minnesota Statutes, "Compulsory Instruction", 120A.22, subd.4, 2015) The institution provides K-12 pupils with compulsory instruction in the following curriculum areas

(Minnesota Statutes, "Compulsory Instruction", 120A.22, subd.9, 2015): basic communication skills, mathematics and science, social studies, health and physical education. A person providing this instruction must meet the following requirements: hold a valid Minnesota teaching license and/or be directly supervised by a person holding a valid Minnesota teaching license (Minnesota Statutes, "Compulsory Instruction", 120A.22, subd.10, 2015). In addition, a statewide-standardized achievement examination is administered each year to assess student performance and submitted to the school district's superintendent (Minnesota Statutes, "Compulsory Instruction", 120A.22, subd.11, 2015).

Operational: For the purposes of this study, formal education is characterized as a parochial, charter, or public institution where students between the ages of 6 and 18 attend regularly, with class schedules following the required curriculum subjects set by the state, and often occurs in an accredited institution.

In addition, formal education may follow one of two classroom schedule formats: a "traditional schedule" where the classes are regularly scheduled and followed weekly, and a "non-traditional schedule" where classes may not follow a weekly set schedule, but built to accommodate student learning as the school year progresses.

Environmental Education

Nominal: environmental education seeks to create environmentally literate citizens that have the awareness, knowledge, attitudes, skills, and opportunity to participate in solving environmental problems (UNESCO, 1978).

Operational: Within this study, environmental education is the education provided by Wolf Ridge Environmental Learning Center within the Student Teacher

Program during a nine-month internship. This education is provided through staff training, seminars, and formal and non-formal classroom teaching experiences. environmental education is also what the student teachers are providing to elementary school, middle school, high school, college students and adults during their nine-month internship.

Teacher Preparation Programs

Nominal: "A State-approved course of study, the completion of which signifies that an enrollee has met all the State's educational or training requirements for initial certification or licensure to teach in the State's elementary or secondary schools. A teacher preparation program may be a regular program or an alternative route to certification, as defined by the State" (Code of Federal Regulations: Title-34 Education, 2012, p.306)

Operational: Within this study, the Wolf Ridge Student Teacher Program is organized as a teacher preparation program offering varying educational methods and strategies to pre-service teachers that result in certification or licensure within the state at the completion of the program.

Environmental Learning Center

Nominal: The Minnesota Department of Natural Resource under the guidance of the environmental education Committee defined an environmental education center (EEC) as "any facility, other than public or private schools, that offers professional field-based instruction, either full or part-time, including both residential and day use facilities. The instruction offered is designed to increase understanding of ecological systems and the complex interrelationships between people and nature. environmental education

centers provide experiences to assist citizens to increase their sensitivity and stewardship for the environment" (EEC, 1992, p. 5). A list of characteristics specifically defining a residential environmental learning center (RELC) includes:

- a formal environmental education mission statement with a strategic, long range goal;
- established public or non-profit status;
- qualified staff including administration, instructors, food service and maintenance;
- an ongoing environmental education instructional program (minimum 9 months) consistent with *A GreenPrint for Minnesota: State Plan for environmental education*;
- a significant level of land and building resources;
- accommodations for eating, sleeping, and learning;
- a program that devotes 80 percent of the budget to environmental education;
- a program that devotes 80 percent of the school year to K-post secondary;
- a program that devotes 80 percent of the summer program to environmental education, and
- accreditation from the North Central Association of Colleges and Schools (EEC, 1992, p. 34-35).

Operational: Wolf Ridge Environmental Learning Center is an educational facility where naturalists and student teachers participating in the WRSTP teach via experiential education methods within outdoor environments, and receive their training in environmental education for a period of nine-months.

Chapter Two. Review of Literature

"*Education is not preparation for life; education is life itself. The most important attitude that can be formed is that of desire to go on learning.*"
— John Dewey

Introduction

The meaning of environmental education continues to evolve through each generation (Heimlich, 2002). Research into the historical development of environmental education within the United States lend context to the present trends educators and university administrators may follow today. Key features of past trends of environmental education can provide helpful insights into the varied types of environmental education programming observed presently within teacher preparation programs. Unpacking past and current trends also aid in painting a clearer picture of the Wolf Ridge Environmental Learning Center (ELC) and the Wolf Ridge Student Teacher Program.

Trends and Current Practices of environmental education

The term *environmental education* was first mentioned by Thomas Pritchard at the World Conservation Union (IUCN) conference in 1948, declaring a need for a more blended approach to natural and social sciences within education, and attributing the label *environmental education* (Heimlich, 2002; Palmer, 1998). Even before this inaugural conference, environmental education did exist under different terms and methods - the environmental movement had once been conceived as nature study, outdoor education, and conservation education (Archie & McCrea, 1996). The development of Dewey's philosophy of experiential education offered strategies to incorporate environmental education into school curriculum and is still used as an instructional approach today for many educators (Adkins & Simmons, 2002; Kolb, 1986; McCrea, 2006). It is also the main teaching philosophy of the Wolf Ridge Student Teacher Program (Wolf Ridge ELC,

2013), and is an instructional approach strongly encouraged to be utilized by participants of the program. Experiential education is also the main teaching philosophy of nature study - a concept developed a century earlier.

Nature Study. With growing attention for the inclusion of natural sciences within formal educational institutions, the end of the nineteenth century saw rapid changes to science teaching methods, specifically within elementary schools. Addressing the concern of how to effectively teach natural science to elementary aged children, child psychologists argued the importance of natural curiosity, basic observational skills, and utilization of materials familiar to children as key pieces to learning (Kohlstedt, 2005). Even through additional teacher training that offered the basic science courses prior to the start of the nature study movement, many teachers would hesitate to include science education within their classrooms and revert to more traditional teacher-directed methods of science education (2005). Many teachers reported a lack of knowledge and pedagogical skill to introduce scientific concepts through other student-oriented educational approaches - a statement that parallels the challenges voiced by in-service teachers concerning environmental education today. In fact, these sentiments strongly align with the logistical barriers mentioned in chapter one (Barrett, 2007; Ernst, 2007; Ham & Sewing, 1988; Holden et al., 2011; Lane & Wilke, 1995; Simmons, 1998)

Wilbur Jackman initiated the concept of "nature study" to emphasize both experiential education and discovery-learning within young children. Jackman, in 1892, compiled a teacher manual entitled *Nature-Study for the Common Schools* as a way to guide instruction techniques, and eventually establish a nature-study curriculum within schools (Kohlstedt, 2005; McCrea, 2006). Regarding elementary science education,

Jackman is accredited with setting forth some of the early ideals for education that are still important today: inquiry and discovery with first-hand observation and experience (Disinger & Monroe, 1994, p. 10). Components of nature study are still utilized today by many programs. For example, the current vision of the Wolf Ridge Environmental Learning Center states, "Fostering awareness, curiosity and sensitivity to the natural world", and "Providing lifelong learning experiences in nature" (Wolf Ridge ELC, 2013) - both reflecting Jackman's earlier ideals.

Conservation Education. The spark of the Conservation Era began when issues in America's Heartland of wind erosion and displacement of natural resources surfaced, giving way to the "The Dust Bowl" (McCrea, 2006; Gardner, 2009). Because of the drastic changes in weather, creating droughts across the Midwest, special attention by federal, state, and non-governmental organizations was given to conserve natural resources (Daudi & Heimlich, 1997; McCrea, 2006), and public awareness concerning environmental problems became a focus. Wilderness philosopher Aldo Leopold publicly shared ethical viewpoints concerning human uses of the natural environment, and the need for awareness of an intertwining community between human and natural ecosystems (Hay, 2002; Leopold, 1949; Rolston, 2000). Published in 1949, Leopold's *Land Ethic* concerning land use is still referenced today by a wide range of individuals within various fields - policy makers, biologists, educators, economists, developers, historians - and the list continues (Rolston, 2000).

With the backing of keen individuals like Leopold and governmental agencies, science and ethical values began to merge together in the field of science ecology (Hay, 2002). Within the field of education, the National Education Association took a greater

role in promoting the conservation of natural resources; and Wisconsin, in 1935, was the first state to pass a statue mandating pre-service teachers to have adequate preparation regarding the conservation of natural resources (McCrea, 2006). The efforts of integrating values and science within conservation education was aided by the Progressive Education Reform of the 1930s, encouraging attention to the new methods of a holistic approach to both experiential learning and conservation education within schools (McCrea, 2006; Palmer, 1998). Today, conservation and stewardship is a concept promoted by staff at Wolf Ridge Environmental Learning Center, and taught by participants within the Student Teacher Program.

Outdoor Education. The foundation of residential outdoor education took place with the establishment of school group camping in 1925 (AEOE, n.d.). Extended visits lasting 3 to 5 days in an outdoor setting paved the way for many residential outdoor education centers and programming in existence today (Palmer, 1998). With beginnings as recreational programming geared towards camping experiences and other leisure activities such as hiking, programming and curriculum eventually evolved to include more educational aspects (Ford, 1986; Hammerman, 1980). The notion of outdoor education, aided by components of the nature study movement, conservation education, and Dewey's (1925) experiential education (Ford, 1986), gave way to another perspective to education outdoors. Many outdoor experiences are currently formatted to include first-hand experiences with nature and environmental sciences through social learning situations (AEOE, n.d.; Ford, 1986; Hammerman, 1980). Activity examples are hiking, swimming, boating, winter sports, camping, canoeing, and in some programs cycling (Gilbertson et al., 2006).

To further break down outdoor education, it focuses on the intersection of ecological relationships, physical skills, and interpersonal relationships. These subject areas are provided to students through experiences facilitated by environmental educators, and therefore lie within Dewey's theory of experiential education (Gilbertson et al., 2006). The three subject areas lend to the three education domains of environmental education, ecotourism, and adventure education. For example, the use and support of physical skills by the learner within an activity, coupled with interpersonal growth and reflection by the learner aid in the development of an adventure education experience (Gilbertson et al., 2006; Hammerman & Hammerman, 1985). Through activities such as camping, canoeing, rock climbing, or a high ropes course challenge, learners strengthen a sense of community among fellow group members completing the same task while facing physical challenges. Within environmental education, both ecological relationships and interpersonal growth and educational skills are enhanced.

In order to build a citizenry that is concerned and aware of the environment and associated problems, the knowledge and commitment needs to be present as well (UNESCO, 1978). Building a strong sense of ecological relations to the natural world with an increase in self-awareness and insight of interpersonal growth will aid in that development of knowledge and commitment (Gilbertson et al., 2006). Outdoor education encompasses the three domains of adventure education, environmental education, and ecotourism through the use of three skill areas. Although some outdoor education programs today may follow more adventure-based models, such as Outward Bound or National Outdoor Leadership School (NOLS), an element of environmental education and ecotourism presides within each program model. Residential Education Learning

Centers (RELC) also promote various components, although environmental education typically is the primary domain.

Progressive Education Reform. "While environmental education focuses on how to live correctly in the world, experiential education teaches through the senses in the natural world" (Louv, 2005, p. 201). environmental education does not solely include the developmental and changing practices within approaches to science and nature education, but also includes the changing practices in the field of general education (Newton et al., 2012). As a key philosopher and leader of the Progressive Education Reform during the 1930s, John Dewey urged change from the teacher-oriented traditional educational setting to a more student-directed educational setting, emphasizing experiential education as the main method of teaching and learning (Dennis & Knapp, 1997; Dewey, 1938; Lewis & Williams, 1994; McCrea, 2006).

Within *Education and Experience* (1938), Dewey advocates learning as ultimately grounded through personal experiences, connecting the student to education through significance of the experience and across all disciplines within education. He outlines the educator's role within this approach as a facilitator rather than dictator of knowledge, making education more sensitive to the needs of the children rather than to the needs of the teacher.

> A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete surroundings that are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and social, that exist so as to extract from them

> all that they have to contribute to building up experiences that are worthwhile. (Dewey, 1938, p. 40)

Dewey's pedagogical approach to education, particularly his connection and promotion of nature study and education (1925), gives greater emphasis on the possible instructional approaches and practices for teachers currently. Eventually, instruction improves overall when students are able manipulate materials within an experience (Carrier, 2009; Dewey, 1938; Riordan & Klein, 2010).

Belgrade Charter and Tbilisi Declaration: The Reference for Environmental Education. Although the term environmental education was first used in 1948, it was not until the late 1960s and 70s that this term was mainstreamed within environmental literature (Daudi & Heimlich, 1997). Rachel Carson's published book Silent Spring (1962) and Earth Day (1970) are both accredited with drawing awareness to current environmental concerns of pollution and mobilizing public environmental efforts (Gardner, 2009) With more public awareness drawn to environmental quality, the newly established Office of environmental education created with the passing of the National environmental education Act of 1970 began to distribute educational resources and funding opportunities to schools. An emphasis on the infusion of science and technology within society became apparent as did the promotion of nature awareness within schools (2009).

Another organization developed in 1970 was the Western Regional environmental education Council (WREEC), which promoted partnerships between educators and natural resource professionals to enhance the field of environmental education (McCrea, 2006). Project Learning Tree and Project WILD, two programs founded by WREEC a

decade later, are presently used among professional environmental educators to train in-service teachers in adapting environmental-related curriculum materials within the formal classroom (Archie, 2009; Disinger & Howe, 1990; Powers, 2004). These resources, along with Project WET, are still incorporated through teacher workshops and university programs as a means to incorporate environmental education into the classroom (Archie, 2009, Bodzin & Peffer, 2010).

In 1971, the National Association for Environmental Education - currently the North American Association for Environmental Education (NAAEE) - was founded initially as a means for environmental educators to connect with one another (Disinger & Monroe, 1994). Educators from all settings, including non-formal and formal, began to attend the conferences organized by NAAEE, sharing the ideals of education and conversation of natural resources.

Laying the foundation for environmental education that is still drawn upon today, the Belgrade Charter (1976) defined the principles of environmental education. In Belgrade, Yugoslavia (1976), to address the degradation of the environment and environmental issues across the world, UNESCO proposed a goal statement for environmental education. The statement highlights the need for an environmentally literate citizenry possessing the knowledge skills, attitudes, and motivations to work towards a solution to current environmental issues and prevent new issues from arising (UNESCO, 1978). As the field has continued to evolve, these principles have been researched, assessed, revisited, and expanded (NAAEE, 2004).

Efforts in Aligning Current Education Policy and Procedure with environmental education

Although environmental education includes the application of both cognitive and affective dimensions with a focus on ecological foundations, there exists a strong concern for attitude and motivation, with environmental sensitivity as one of the predictors of environmental behavior (Dennis & Knapp, 1997). Realizing the need for standards to evaluate and assess environmental literacy, the NAAEE began the National Project for Excellence in environmental education as a way to address the need for education reform (NAAEE, "Standards for Teacher Preparation", 2007). Stemming from the defining goals and objectives of the Belgrade Charter and Tbilisi Declaration, the NAAEE set the environmental education field's first environmental education standards through *environmental education Materials: Guidelines for Excellence* in 1996 (McCrea, 2010). The National Project for Excellence in environmental education continued to research, develop and release more national guidelines as a means of assisting environmental education providers in developing quality environmental education programs (Carelton-Hug & Hug, 2010). This series of guidelines for environmental education includes: *Guidelines for Learning (K-12)* (1999)*, Guidelines for Preparation and Professional Development of Environmental Educators* (2000)*, Guidelines for the Preparation and Professional Development of Environmental Educators* (2004), *Non-formal environmental education Guidelines* (2004)*, Early Childhood environmental education Programs* (2010). Revisions have been made to each publication since their first adoption, and have been utilized within multiple organizations and programs as a means

for guidance, assessment, and evaluation of environmental education programming (McCrea, 2010).

Since the first inception of the *Guidelines for Excellence* in 1996, NAAEE has partnered with other organizations in an effort to weave environmental education into national education standards. NAAEE has been a member of the National Council for Accreditation of Teacher Education (NCATE) since 2002, which is now the Council for Accreditation of Educator Preparation (CAEP). CAEP is an accrediting body of schools, colleges, and departments of education (Gardner, 2009). Nearly 700 teacher preparation programs in the United States are CAEP/NCATE accredited, a process that indicates a commitment to and focus on effective teacher preparation (Newton et. al, 2012). In 2007, NAAEE was adopted as a Specialized Professional Association (SPA) by the CAEP/NCATE (Archie, 2009; NAAEE, 2007). Since CAEP/NCATE is charged with determining if teacher preparation programs are following accreditation standards, this includes standards for specific program options, such as the guidelines set by NAAEE as an SPA. "Providers ensure that candidates apply content and pedagogical knowledge as reflected in outcome assessments in response to standards of Specialized Professional Associations (SPA)…" ("Content and Pedagogical Knowledge", CAEP, 2016). The NAAEE *Standards for the Initial Preparation of Environmental Educators* (2007) were set as program standards in conjunction with CAEP/NCATE accreditation standards, therefore certain university teacher preparation programs can choose to offer this specific training to their student teachers. Although these NAAEE standards were adopted by CAEP/NCATE and are offered as a specialized programming option for university teacher preparation programs, the level of participation to follow these environmental

education standards will vary within teacher preparation programs. As of 2016, there are no mandated environmental education standards within the federal education standards, which include teacher preparation standards and K-12 education standards.

A study conducted in 2004 regarding the perceived barriers of environmental education within university teacher preparation program curriculum revealed the presence of CAEP/NCATE standards as an important component of inclusion/exclusion of environmental education into teacher preparation programs (McKeown-Ice, 2004). Typically, university professors would not introduce certain environmental education concepts if that concept was not regarded as a CAEP/NCATE requirement (2004). With the adoption of the standards set by NAAEE as an SPA, this initiative may ultimately result in enhanced exposure of pre-service teachers to environmental education content, pedagogy, resources, and professional networks (Bodzin & Peffer, 2010). In order for pre-service teachers to address the evolving environmental concerns within our society, they must be prepared to engage children in environmental education and move beyond mere content knowledge to an understanding of connections between disciplines, an awareness of the local environment, and knowledge of developmentally appropriate instructional approaches (Gardner, 2009). These approaches should also align to current K-12 state education standards, as teachers have to modify and adapt lessons and curriculum to meet the K-12 state expectations. This applies especially if the state expectations include an expectation to teach environmental education, such is the case in Washington and Wisconsin K-12 education standards. Again, CAEP/NCATE will accredit “Providers who ensure that candidates demonstrate skills and commitment that afford all P-12 students access to rigorous college- and career-ready standards (e.g., Next

Generation Science Standards, National Career Readiness Certificate, Common Core State Standards)" ("Content and Pedagogical Knowledge", CAEP, 2016).

Both in-service and pre-service teachers are required to use academic standards in various content areas, including science, math and English Language Arts (ELA) as the major academic components. State standards followed from some but not all states include: Common Core State Standards (CCSS), which focus in Math and ELA, the Next Generation Science Standards (NGSS) which is focused in Science, and in general, State K-12 Academic Standards which vary from state to state in terms of grade level expectations for all content areas. Currently, in Minnesota, the state standards followed by pre-service and in-service educators include CCSS, NGSS, and the Minnesota K-12 Academic Standards.

In order to become a licensed educator, pre-service teachers need to be proficient in content knowledge within their content licensure. For some states, if environmental education is not included in the state standards, then the expectation to teach environmental education is non-existent, such is the case in Minnesota. This in turn affects the inclusion - or lack of inclusion - of environmental education into university teacher training programs. In addition, the states who do recognize environmental education as a state standard typically regard it as a topic or unit, not necessarily a holistic or multi-disciplinary content area. Therefore, recognizing proficiency or mastery in environmental education within university teacher training programs is not a pre-requisite to licensure currently.

It is pertinent to understand the current educational reform efforts nationally and within the state of Minnesota as these teachers will have to adapt and modify their

lessons and curriculum to meet the current standards. Therefore, it directly correlates to this study in an effort to understand, from a pre-service program perspective, what will be expected of pre-service teachers entering into the field. Currently, there are no mandated environmental education K-12 academic standards that have been adopted across all states. Therefore, environmental education is not expected to be taught within the classroom unless it is expected and defined within state standards, such as Wisconsin and Washington. In Minnesota, environmental education as it relates to human behavior and the impacts on the environment is not required until grades 9-12 under the Life Science Strand within the Minnesota Academic Standards for Science (2010). Ultimately, this lends insights for the evaluator regarding challenges and opportunities when meeting state standards, and the instructional methods a teacher who participated in the Wolf Ridge Student Teacher Program may use in their classroom.

While education reformers recognize environmental education as an effective tool in gaining K-12 students' enthusiasm for learning in subject areas ranging from math and science to literature (Carrier, 2009; Lieberman, 1996; Holden et al., 2011), K-12 teachers need opportunities to realize this notion as well (Riordan & Klein, 2010).

In-service Educator Perspectives of Environmental Education

Environmental education has much to contribute to educational reform and more specifically, to how we construct effective teacher professional development (Riordan & Klein, 2010). In recent years, opportunities for teacher professional development in the areas of science have expanded beyond traditional district-led workshops to include experiences in informal settings (science museums and nature centers) and outdoor

spaces (school grounds, parks, native land), as well as opportunities to participate in science research (Holden et al., 2011).

However, many teachers, while interested in engaging students in environmental education, struggle with successful integration, whether in the classroom or in connecting students to fieldwork opportunities outdoors (Ainsworth, 1997; Ferry, 1995; Riordan & Klein, 2010; Simmons, 1998). Teachers do not think that they have the knowledge or abilities to teach environmental education because of lack of training (Plevyak, 1997; Smith- Sebasto & Smith, 1997). There is also little research about how teachers develop and implement curriculum or use materials from professional development experiences such as Project WET or Project WILD (Riordan & Klein, 2010).

Despite the resources available to prospective educators for developing appropriate competencies, many teachers continue to encounter challenges in implementing science instruction, particularly in the outdoors. The source of these challenges can be conceptual (such as lack of experience and content knowledge) or logistical (time, curriculum, administrative support) (Ham and Sewing, 1988; Holden et al., 2011). Addressing the conceptual barriers regarding lack of training or knowledge, some university pre-service teacher preparation programs have been steadily integrating environmental education into their curriculums through the years (Archie, 2009).

Pre-service Teacher Preparation Programs Integrating Environmental Education

Many in-service teachers report a lack of training in environmental education within their pre-service teacher preparation program, and therefore do not feel comfortable with the instructional methods concerning environmental education within the classroom and other settings (Disinger & Howe, 1990; Ernst, 2007; Lane, 1994;

Moseley et al., 2002; Sia, 1992). Because there is no one way to integrate environmental education into teacher certification requirements that would reach all teacher preparation programs, a multitude of approaches have developed overtime (Heimlich & Barringer-Smith, n.d.).

Current Teacher Preparation Program Models and Environmental Education: Four Broad Approaches. In 2004, the environmental education and Training Partnership (EETAP) outlined four broad approaches to incorporating environmental education into K-12 schools and curriculum. Although these approaches were originally written to give an overall synopsis of environmental education as it is used in primary, middle, or secondary schools, "it is also apparent that every level of education can make use of these approaches and techniques" (EETAP, 2004, p. 2). Therefore, the four approaches outlined by EETAP will illustrate the diverse models of current university teacher preparation programs that are incorporating environmental education into curriculum and methods. The four approaches outlined are infusion, imposition, insertion, and framing and will be described through current teacher preparation program examples. In addition, the amount of time devoted to exposure of environmental education concepts and methods varies between the four approaches. Therefore, an illustration (see Figure 1) was developed that sets the four approaches along a continuum to depict the varying degrees of experience in environmental education these programs have to offer.

Infusion is the incorporation of environmental concepts, activities and examples into existing curricular goals (EETAP, 2004). Within university teacher preparation programs, many "content" courses, such as natural sciences or social sciences, follow this

approach (Powers, 2004). In practice, this means incorporating concepts of environmental issues into content courses, such as natural science or social science methods, through activities as they connect to the greater science or social science curriculum. This occurs at multiple universities.

Imposition refers to making environmental topics requirements in the curriculum (EETAP, 2004). An example that includes this approach is the university teacher preparation programs within Wisconsin mandated by the state to include environmental education as a content course (Wisconsin State Legislature, 2010). Only a few states in the United States have mandated pre-service environmental education requirements (Wilke, 1985). As a result, only a handful of teacher preparation programs require courses or other preparation specifically in environmental education (Drzewiekcki & McDuff, 2005).

Insertion is the addition of an environmental unit or course to the class or curriculum. Certification programs or endorsement programs will fall into this category. The newly developed Environment and Sustainability specialty endorsement in Washington state serves as an example of insertion (OPSI: WA, 2010). This area of endorsement can be added to an existing teaching certification, and may include a small number of required courses focusing specifically on the foundations of education for sustainability and environmental education in formal education settings (Woodring, 2011). The Kentucky Education Professional Standards Board (EPSB), which accredits education programs of Kentucky colleges and universities, recently adopted a certificate in environmental education that can be earned alongside K-12 teacher licensure (EPSB, "Teaching Certificates", 2015). Similarly, the University of Minnesota Duluth offers an

emphasis in environmental education for secondary education majors. These courses apply to those seeking secondary licensure in Life Science or Earth and Space Science (UMD, "Education", n.d.) These programs all illustrate incorporating environmental education into teacher preparation through insertion.

Framing refers to eliminating the subjective boundaries of traditional disciplines and instead creating a structure of study that integrates subject areas (EETAP, 2004). McKeever Environmental Learning Center located in Sandy Lake, Pennsylvania offers an 8-week student teaching opportunity within their center and surrounding school districts. student teachers receive extensive training before teaching the curriculum provided through the center to visiting school groups. In addition, the curriculum is brought to surrounding school districts as in-school programs (McKeever, 2011). The Wolf Ridge Student Teacher Program would also fall into the framing approach as it integrates environmental education into varying subject areas within the curriculum. The structure of the program is non-traditional, emphasizing instructional practice in environmental education. Both of these programs place environmental education as the core topic, and the subject areas fall under the umbrella of environmental education.

"It is clear that there are not only a variety of approaches to integrating environmental education into schools such as infusion and insertion, but also a vast array of environmental techniques that are being used" (EETAP, 2004). The Wolf Ridge Student Teacher Program is one model among many that exists as an approach to incorporating environmental education into teacher preparation programs. Currently, a gap exists between the potential for evaluation to inform environmental education programming and actual practices as the majority of environmental education programs

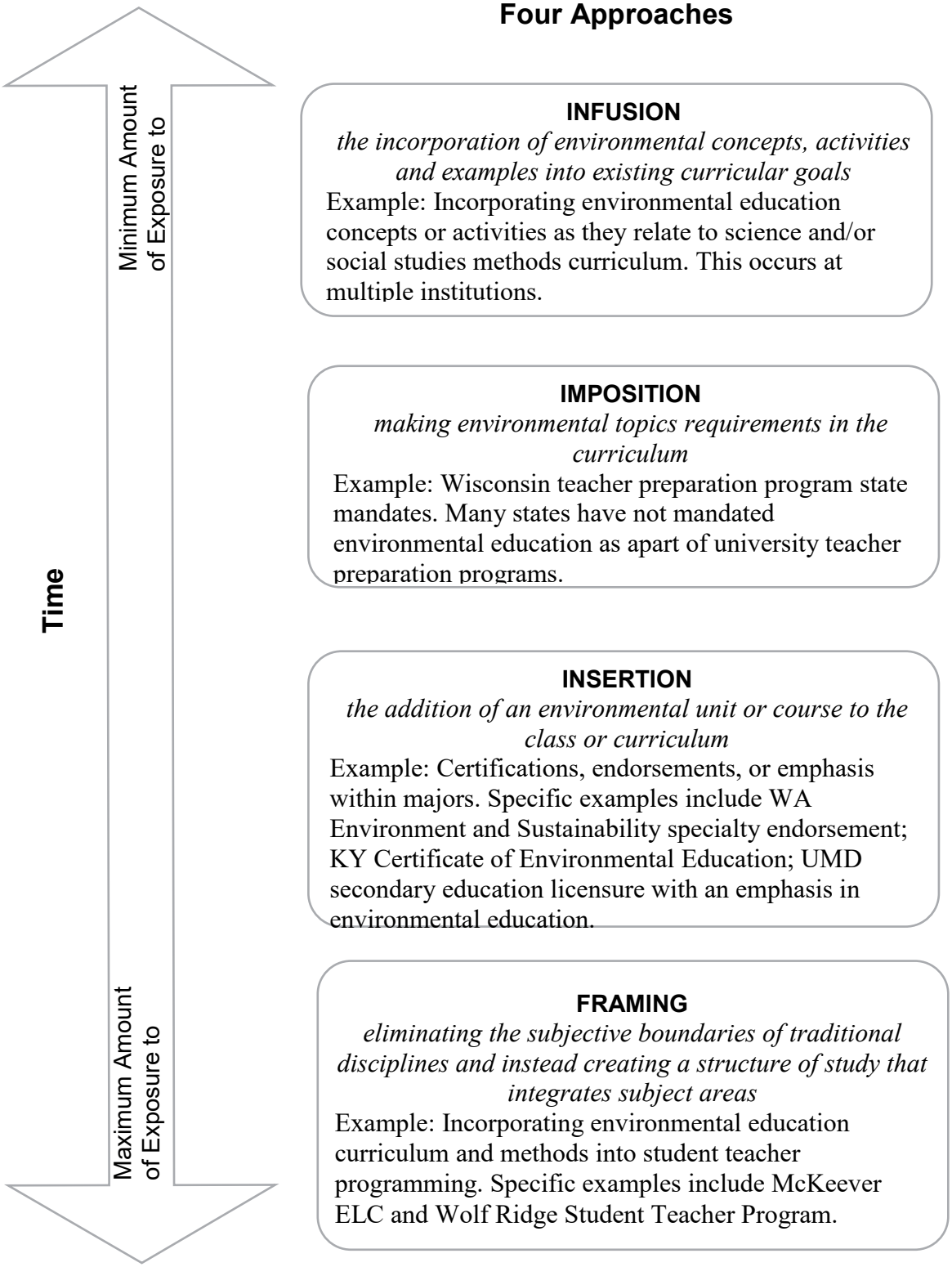

Figure 1. The four approaches to incorporating environmental education as applied to university teacher preparation programs. Each approach is laid along a continuum depicting the varying degrees of experience the field of environmental education according to time (adapted from EETAP, 2004).

have failed to incorporate quality evaluations into their programming (Carleton-Hug & Hug, 2010). As this is an evaluative study, further description of the Wolf Ridge Student Teacher Program is required and follows in the next section to give the greatest depth of understanding to program components, inputs, and outcomes.

Wolf Ridge Student Teacher Program

"The training program is a collaborative effort between Wolf Ridge and the University of Minnesota Duluth (UMD)" (Walewski, 2003). It is through the cooperation of participating university preparation programs and Wolf Ridge staff that this program has continued since its first inception in 2004.

The Wolf Ridge Student Teacher Program is open to all final year education students pursuing teaching-licensure in areas of elementary, middle-school, and secondary education. Each year, two student teachers are selected from participating universities. Currently, Wolf Ridge ELC is partnered with the UMD, although past partnerships have included other university preparation programs located within the state of Minnesota. The Wolf Ridge Director of Naturalist Training and the UMD Associate Professor of Education provide guidance and support for the selected participants. The program timeline consists of 26 weeks of non-formal teaching experience at Wolf Ridge ELC, an accredited school and residential environmental learning center, and 10 weeks formally teaching off-site at their placement school. Placement schools are chosen based on student teachers' requirements, typical of most student teacher preparation programs, and may be based in schools located several hours from Finland, Minnesota.

Because the WRSTP aims to bridge the gap between the formal and non-formal classroom settings, this next section will describe the program in its two parts: the

university teacher preparation program partnership component and the Wolf Ridge ELC component.

Partnerships with Participating University Teacher Preparation Programs. In order to become a licensed teacher within the state of Minnesota, candidates must follow several statutes set by the Minnesota Revisor Office. Listed below are the requirements set by these statues that all student teachers must fulfill. Following the Minnesota Administrative Rules required of all accredited teacher preparation programs, Standards of Effective Practice for Teachers (8710.2000) subpart 1 states, "A candidate for teacher licensure shall show verification of completing the standards in subparts 2 to 11 in a teacher preparation program…" (8710.2000). Before a Minnesota teaching license is obtained, "the institution requires that candidates in teacher preparation programs complete a professional sequence of courses based on the components under part 8710.2000" (8710.7600 subpart 5.A.2). The components, listed as required standards for teacher competency under part 8710.2000 and incorporated by all Minnesota university teacher preparation programs, are as follows:

> *Standard 1, subject matter*: A teacher must understand the central concepts, tools of inquiry, and structures of the disciplines taught and be able to create learning experiences that make these aspects of subject matter meaningful for students;
>
> *Standard 2, student learning*: A teacher must understand how students learn and develop and must provide learning opportunities that support a student's intellectual, social, and personal development;
>
> *Standard 3, diverse learners:* A teacher must understand how students differ in their approaches to learning and create instructional opportunities that are adapted to students with diverse backgrounds and exceptionalities;
>
> *Standard 4, instructional strategies:* A teacher must understand and use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills;

> *Standard 5, learning environment:* A teacher must be able to use an understanding of individual and group motivation and behavior to create learning environments that encourage positive social interaction, active engagement in learning, and self-motivation;
>
> *Standard 6, communication:* A teacher must be able to use knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom;
>
> *Standard 7, planning instruction:* A teacher must be able to plan and manage instruction based upon knowledge of subject matter, students, the community, and curriculum goals.;
>
> *Standard 8, assessment:* A teacher must understand and be able to use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student;
>
> *Standard 9, reflection and professional development:* A teacher must be a reflective practitioner who continually evaluates the effects of choices and actions on others, including students, parents, and other professionals in the learning community, and who actively seeks out opportunities for professional growth;
>
> *Standard 10, collaboration, ethics, and relationships:* A teacher must be able to communicate and interact with parents or guardians, families, school colleagues, and the community to support student learning and well-being.

The student teacher does not learn all of these competencies within the state mandated ten-week student teacher experience, but through "a professional sequence of courses" (8700.7600) completed within four years of the university teacher preparation programs. As will be described in the Wolf Ridge section of the program, these competencies are practiced within both a formal classroom setting and a non-formal classroom setting at Wolf Ridge ELC. Because teacher candidates must fulfill both the standards set by participating universities and by WRELC, it is important for the evaluator to be aware of the expectations set for teacher candidates of a formal classroom and school environment as well as the non-formal environment (as discussed in the

following section). In addition, not all teacher candidates are accepted into the WRSTP as each candidate needs to apply and interview prior to the start of the program in August. Up to two student teachers are accepted per year.

Once accepted, after two weeks of orientation and training in curriculum and lesson strategies at Wolf Ridge ELC in August, one of the two student teachers is placed into a formal classroom to begin their student teaching practicum. They are placed with a cooperating teacher, who plays the role of mentor in allowing the student teacher to take part in all aspects of the classroom. According to the current partnership with UMD, "Teacher candidates should plan, teach and assess lessons, become competent in classroom management and begin to understand the school/program as a professional community" (UMD, "Field Experiences", 2015). Dependent upon content-licensure area, student teachers perform a number of tasks. Listed below (Table 1) is a comprehensive list of student teacher responsibilities as they relate to teacher competencies outlined in both the *Elementary and Special Education Student Teaching Handbook* (2015) and the

Table 1. Responsibilities of the student teacher according to UMD School of Education Policy.

• Become familiar with the school and building policies (i.e. support services, classroom management policies, medical procedures, technology equipment) • Write detailed lesson plans and units (these should meet Minnesota Academic Standards) • Show evidence of long-range planning by submitting evaluation of lessons • Complete all reflections for lessons and units taught • Participate at parent-teacher meetings, department meetings, faculty meetings	Organize and maintain records of student grades and assignments Return student work on a timely basis Notify in case of absences Participate as a full faculty member Submit self-evaluation at the end of the experience Observations recorded by cooperating teacher on a daily basis Mid-year evaluation by either cooperating teacher or university supervisor End-of-year evaluation by either cooperating teacher or university supervisor

Secondary and K-12 Student Teaching Handbook (2015).

In addition, student teachers must complete the requirements set by the edTPA (Educator Teacher Performance Assessment). "edTPA is a performance-based, subject-specific assessment and support system used by teacher preparation programs throughout the United States to emphasize, measure and support the skills and knowledge that all teachers need in the classroom. edTPA is a subject-specific assessment that includes versions for 27 teaching fields. The assessment features a common architecture focused on three tasks: Planning, Instruction, and Assessment" ("About edTPA", 2016).

Beyond the statutes listed above, teacher licensure has also been impacted by the recent changes in the state's education standards. Currently, student teachers are expected to follow *Minnesota K-12 Academic Standards* within the areas of English language arts, mathematics, science, social studies and physical education (Minnesota Department of Education, 2014; UMD, IESE Student Teaching Handbook, 2015). Adoption of the *English Language Arts* within the Common Core State Standards in 2010 led to new revisions of the *Minnesota K-12 Academic Standards* (Minnesota Department of Education, 2014), which student teachers are expected to follow when teaching in practicum classrooms ("Standards of Effective Practice for Teachers", 2015; UMD, IESE Student Teaching Handbook, 2015; UMD Secondary Student Teaching Handbook, 2015). Likewise, all Minnesota teachers will be expected to follow the newly developed Next Generation Science Standards (NGSS), scheduled for adoption into the Minnesota Academic Science Standards in 2017 (Minnesota Department of Education, 2014).

To summarize all that is expected of student teachers whom are currently graduating from UMD, below is a brief summary of the required responsibilities set by

UMD Department of Education. The student teacher during their practicum experience will (UMD IESE Student Teaching Handbook, 2015, p. 30):

> Develop and demonstrate skills and knowledge needed to facilitate learning in a group of children/young adults,
> Apply theories and best practice strategies in a field placement setting,
> Develop a sense of professional identification with early childhood, elementary, middle and or high school education,
> Team with colleagues and parents as needed to plan effective programs for children with diverse needs,
> Objectively self-evaluate personal practice in teaching,
> Become empowered to assume the roles and responsibilities of a beginning teacher.

Researching the above standards and expectations set by both the state of Minnesota and UMD will inform the evaluator of the requirements of student teachers entering into the formal classroom. Preparing teachers with the tools and skills necessary to effectively educate students in the formal classroom is the aim of the UMD Department of Education. Practicum experience is a vital component for many seasoned educators (Pendergast et al., 2011; Simons et al., 2012) and can lead into the development of a teacher's professional identity as they see themselves today (Flores & Day, 2006; Korthagen, 2004). Wolf Ridge is partnered with UMD to provide a unique practicum experience in which student teachers can practice in both a formal and non-formal classroom setting.

Description of the Non-Formal Teaching Experience at Wolf Ridge ELC.

Founded in 1971, Wolf Ridge Environmental Learning Center is situated on a 2000-acre site in northeastern Minnesota, located six miles from the shore of Lake Superior. The site resides within a mixed forest of maple hardwood and boreal trees, wetlands located

near two lakes and a stream located on the property that leads into Lake Superior. Its facilities include two high ropes courses, two climbing walls, four classroom buildings, 18 miles of hiking trails spanning throughout the property that a few convert to as ski trails in the winter, two dormitories, a raptor aviary, a newly built organic farm with a stone oven, and a self-sustaining forestry building that serves as an all-day classroom. More than 165 schools in communities across Minnesota, North Dakota, and Wisconsin attend Wolf Ridge ELC annually, approximating 15,000 children, teachers and parent chaperones (Wolf Ridge ELC, 2013).

Wolf Ridge ELC approaches environmental education from a perspective that seeks to improve visiting students' attitudes and behaviors regarding: environmental responsibility; personal development; social development; and leadership. Correspondingly, Wolf Ridge's mission statement is as follows: "To develop a citizenry that has the knowledge, skills, motivation and commitment to work together for a quality community" (Wolf Ridge ELC, 2013). Through fostering awareness via learning experiences in nature and the modeling of values and behaviors of a sustainable lifestyle, Wolf Ridge promotes the concepts of conservation and stewardship to visiting schools and groups. The teaching philosophy of the organization and staff is grounded in experiential learning through hands-on experiences within the curriculum that involves a holistic approach by addressing multiple learning styles of learners (Wolf Ridge ELC, 2013). The curricular content is based within five domains: science; cultural history; environmental issues; adventure education; and creative arts. Science is broken into sub-categories of earth and physical science, animal ecology, aquatics, and plant ecology. Adventure education is broken into sub-categories of outdoor skills, and personal and

team growth. Over fifty classes are taught that are nearly all outdoors, typically three hours in length. Table 2 summarizes the classes offered at Wolf Ridge ELC to visiting schools and groups. When learning to teach this curriculum, seasonal staff consisting of naturalists and student teachers are trained through a variety of instructional approaches grounded in experiential education, which will be further described below. Sixteen individuals fill the role of naturalist as seasonal staff. It is two candidates within these sixteen that are, in partnership with UMD, fulfilling their teacher licensure. Because environmental education should be introduced in teacher training by credible leaders (Van Petegem, 2005), student teachers are first introduced to the program via a two-week training by Wolf Ridge ELC program teaching staff. During this period, they learn the curriculum content and approaches to teaching environmental education by participating in the lessons first as a student. Through this method, student teachers gain an insight into what a student may experience before teaching the lessons themselves. As referenced in chapter one, student teachers learn to consciously adapt the lessons throughout the year to fulfill learning objectives and better associate the lessons for visiting K-12 groups. The nexus of the program is based on building experiences in non-formal instructional approaches - as experience, together with new teacher competencies and personal mastery, which may eliminate insecurity and build self-esteem within the classroom (Fullan, 1994; Van Petegem, 2005). Then, in a later phase, when teachers feel more comfortable with the subject, they can try out other methods (Van Petegem, 2005). The Wolf Ridge Student Teacher Program reflects Van Petegem's notion of teaching practice and familiarity with the curriculum and teaching methods. Through hands-on, interactive,

Table 2. Classes offered at Wolf Ridge Environmental Learning Center ("Class list", Wolf Ridge ELC, 2013). A graduate student or student teacher teaches each class at least once.

Science	Cultural History	Environmental Issues	Adventure Education	Creative Arts
<u>Animal Ecology</u> • Northwoods Mammals • Frogs and Toads • Moose • Wolf Ecology • Raptors • Owl Pellet • Dissection • Small Mammals • Birds • Beaver Ecology • Animal Signs • Bats	• Voyageur Life • Logging Camp Life • History of the North Shore • Fur Trade • Ojibwe Snowshoe • Ojibwe Heritage	• Changing Climate • Farming and the Environment: Seeds of Change • Renewable Energy • Acid Rain • Lake Superior Game • Energy in My Home	<u>Outdoor Skills</u> • GPS and Geocaching • Canoeing • Competitive Orienteering • Beginning Orienteering • Cross Country Skiing • Night Hike • Winter Survival • Superior • Snowshoe • Superior View Hike • Rock Climbing	• Paper Making • Earth Works • Block Printing • Dream Catchers • Woodland Art
<u>Aquatics</u> • Stream Study • Lake Study • Frozen Lake Study • Fisheries • Management			<u>Personal and Team Growth</u> • Winter Survival • Team Games • Rock Climbing • Adventure Ropes	
<u>Earth and Physical Sciences</u> • Echoes of the Night Sky • Weather • Forecasting • Astronomy • Star Lab • Geology				
<u>Plant Ecology</u> • Wetland • Ecology • Trees and Keys • Plant Study • Forest Ecology				

and exploratory methods, students of visiting K-12 schools are able to make connections to the natural environment. Because experiential learning is a huge component of the Wolf Ridge Student Teacher Program, an illustration is provided to give a further explanation of the experiential learning cycle developed by Kolb (1986). Building on the foundations laid by educational philosophers of Jean Piaget, John Dewey, and Kurt

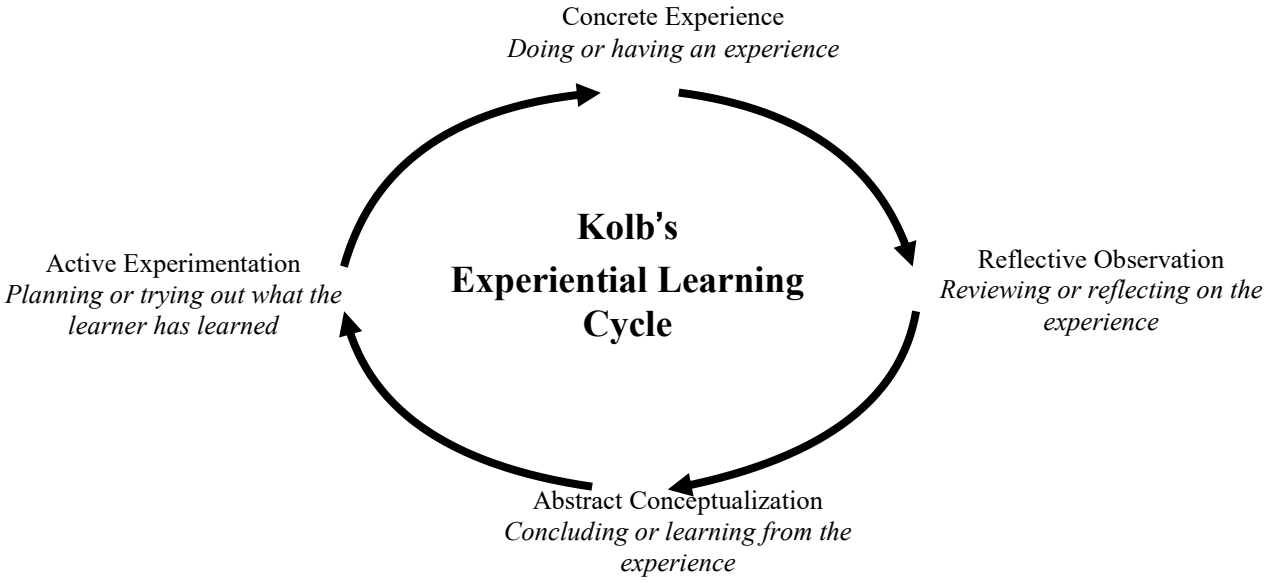

Figure 2. Model of Kolb's (1986) experiential learning cycle depicts the cyclical process of learning based on experiences.

Lewin, Kolb defines experiential learning as a four-part process. First, learners develop concrete experiences, to which reflective observations of those experiences ensues from a variety of perspectives. After reflective observations occur, learners create generalizations or principles that integrate their observations into theories through abstract conceptualizations. Finally, through active experimentation, learners use these generalizations as a guide to promote further action. The process starts over again with another set of concrete experiences. Kolb identifies that any one form of learning is an

incomplete form of processing information (Lewis & Williams, 1994). For meaningful learning to occur as a means to train onerning to occur a, all four stages must be experienced by the learner (Lewis & Williams, 1994). The experiential learning cycle depicted in Figure 2 illustrates this continuous four-part process.

Kolb's Experiential Learning Cycle still continues to evolve within both public and private sectors, incorporating innovative experiential approaches to ensure relevance and meet the needs of diverse learners (Lewis & Williams, 1994). Building upon this work, Wolf Ridge Environmental Learning Center Director of Naturalist Training, Joe Walewski, has adapted his own cyclical learning model (see Figure 3). Utilized as a training tool to connect all major components of learning, it is present within training throughout the year and within individual evaluation of the participant in the program. "I use the model to help Wolf Ridge Naturalists imagine how to respond to the chaotic and changing world of learning and to develop promising practices for environmental

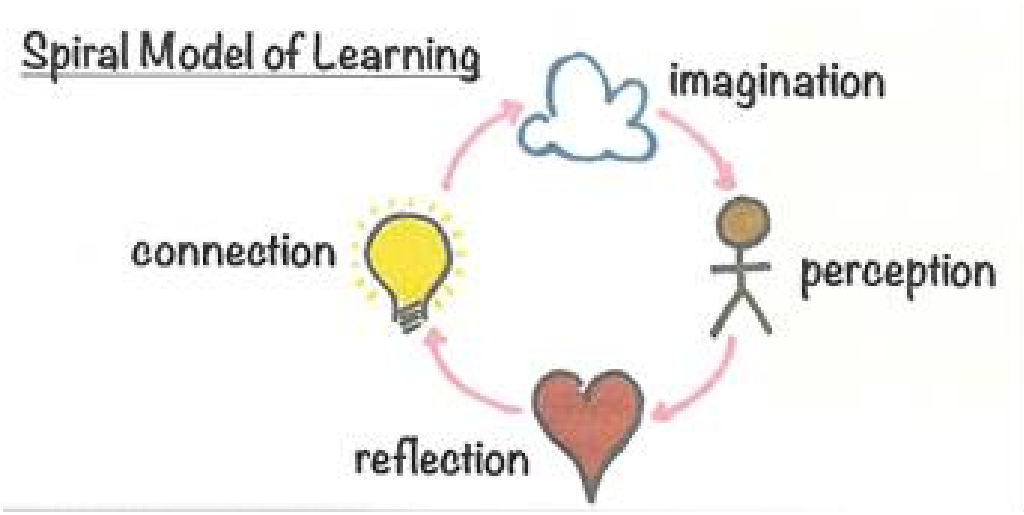

Figure 3. Model of Walewski's Spiral Model of Learning, adapted from Kolb's Experiential Learning Cycle and used as a training tool within the Wolf Ridge Student Teacher Program.

education. It isn't a model of how to teach. Rather, it's a model of how people learn" (Walewski, 2014, p. 1).

As in Kolb's Experiential Learning Cycle (1986), the following description breaks down the components of the Walewski's Spiral Model of Learning. It is a process discussed amongst Walewski and participants of the program, giving emphasis to the role they [participants] will play within a learning environment.

Referring to Figure 3, *imagination* encompasses the concept of building a positive image - the belief that the learner could succeed in an endeavor or learning opportunity. Teachers can encourage this belief.

Just as Dewey emphasizes, p*erception* begins with a learner's personal experience and then dissects the experience through sensory perception. "Teachers should provide learners with an authentic experience fully engaging the senses" (Walewski, 2014, p. 6).

After the learner uses sensory perception to break down the experience, emotions begin to dissect the experience through *reflection*. Many theorists view critical reflection on experience as the key to learner development (Kolb, 1986; Lewis & Williams, 1994). Teachers must provide a safe and supportive learning environment within the class of learners to assess the emotions both collaboratively and personally (Howitt, 2007; Walewski, 2014), as the reflection component allows students to make connections between the academic content and direct experiences in the field (Simons et al., 2012). The knowledge learners may develop in a community depends on the physical environment, the relationship between members within the environment, and the experience (Sutherland & Markausaite, 2012).

Reflection leads into *connection* as the learner initially examines their past, recalling significant events and milestones. Within this stage, learners can identify good and bad trends, discover guiding principles, and highlight the values and actions that shaped the earlier directions and previous practices (Howitt, 2007; Lewis & Williams, 1994; Walewski, 2014); although often the *connection* stage is bypassed and the learning can stop. Habits, defined as patterns and behaviors, are difficult to change and if a new way of thinking is unaffected, the learning process can cease. "As the learner navigates this phase of the spiral learning model, the teacher's responsibility is to help connect the developing story with previous experiences and to help the learner make meaning of the experience" (Walewski, 2014, p. 6).

To complete the cycle, the learner *imagines* a better series of desired actions and goals and is prompted in this endeavor by the teacher - the cycle continues. Ultimately, within both experiential learning models, the role of the teacher is present at each stage and considered vital to the development of the learner. It is grounded through the initiation of an authentic learning experience, which is an often elusive kind of experience that does not manifest easily within the curriculum, but has to be consciously crafted by the teacher (Bandura, 1977; Howitt, 2007). There are multiple interpretations of what constitutes an authentic learning experience. Within some definitions, an authentic learning experience is unstructured, open to a range of solutions, and directly relevant to the "real-world" (Herrington et al., 2003; Stein et al., 2004; Sutherland & Markauskaite, 2012). This hands-on approach to learning is sometimes devoid within real-life situations, eventually losing the central meaning of the lesson, if not linked especially to "everyday social applications" (Dennis & Knapp, 1997, p. 7). Therefore, it

is imperative that learners understand the central meaning of a lesson as it applies to everyday life. An experience not reflected upon is regarded as unrealized learning (Eyler & Giles, 1999; Kolb, 1986; Simons et al., 2012; Williams & Lewis, 1996). Within the Wolf Ridge Student Teacher Program, participants are encouraged to draw upon all components of the experiential learning cycle as means to promote greater meaning of authentic experiences for learners.

Director of Naturalist Training, Joe Walewski, ensures that all naturalists receive the skills and education to effectively teach classes offered at Wolf Ridge Environmental Learning Center. As recently as 2003, he developed the *Environmental Educator Literacy Competency*

Manual (see Appendix B), which is used as a conceptual framework of competencies for the training of the naturalists, student teachers and overall Wolf Ridge ELC program development (Walewski, 2003). Grounding this manual is the understanding that, "an individual having the proper awareness, knowledge, skills, attitudes, and behaviors toward sustaining a healthy environment defines environmental literacy" (p. 16) is at the very heart of environmental education (Walewski, 2003).

Walewski uses this manual for curriculum and training guidelines of the Wolf Ridge Student Teacher Program (Walewski, 2003). A few of the major standards and competencies synthesized within the development of the manual include *Guidelines for the Initial Preparation of Environmental Educators* (NAAEE, 2000), *Guidelines for Excellence in Non-formal environmental education Program and Development Implementation* (NAAEE, 2003), and the Minnesota Teacher Licensure Standards (8710.2000). "It is not used to dictate formal instruction, but guides the structure of both

personal inquiry and formal training covering the scope of competencies expected in the field of environmental education" (Walewski, p. 31, 2003). Within the model, three competency domains reflect the core knowledge, skills, and attitudes required of an effective environmental educator. These domains include environmental, educational, and leadership which are interspersed throughout the Wolf Ridge ELC curriculum and training. For example, knowledge of learning theory is demonstrated when Walewski introduces his Spiral Model of Learning to teachers as a means to discuss approaches to teaching methods in the classroom. This is introduced within the first weeks of training, and falls into the educational domain of the framework. Skills in leadership are practiced during liaisonships when student teachers serve as ambassadors to visiting K-12 schools. Student teachers may experience six to seven liaisonships within the program, assigned to one visiting school per liaisonship. As a liaison, it is the duty of the assigned student teacher to provide customer care, hospitality, and orientation throughout the week. "Additionally, as the Director of Naturalist Training, I am routinely asked by pre-service educators to comment on the validity of learning specific knowledge, skills, and attitudes reflected in the breadth of the final competencies manual. I have either facilitated the training or personally witnessed the use of each one of the listed competencies" (Walewski, 2003, p. 37-38).

The Director of Naturalist Training and the UMD Associate Professor of Education, whom are both primary stakeholders of the Wolf Ridge Student Teacher Program, developed the Wolf Ridge Student Teacher Program Logic Model. The complete logic model can be found in Appendix C. Since no evaluation has occurred to assess long-term impacts of the program, the stakeholders are seeking feedback from

participants who have completed the program and currently teaching within formal classrooms. This will give further insights into program effectiveness and improvement. As this is the first evaluation and feedback given, a qualitative approach is necessary to assess if the outcomes are indeed occurring. As described below, the utilized-focused evaluation has been determined to be the best approach when evaluating this program.

Utilization-focused Evaluation

Originally developed as a means to evaluate governmental program effectiveness, evaluation began to evolve methods to assessing outcomes and results of governmental programs that were lacking accountability of inputs to outcomes (Patton, 1997). As evaluation continued to expand through the years, the focus of program effectiveness and use of findings became a focus point. Later, fundamental questions developed concerning the role of evaluation, such as evaluation contribution to program effectiveness and improvement, as well as identifying those involved in the process of evaluation and their impact. Patton developed the utilization-focused evaluation (UFE) as a means to answer these questions and offer a framework for which program evaluation can follow (1997).

Patton (1997) distinguishes utilization-focused program evaluation from program evaluation in his definition (Carleton-Hug & Hug, 2010):

> *Program evaluation is the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness and/or inform decisions about future programming. Utilization-focused program evaluation is evaluation done for and with specific intended primary users for specific, intended uses* (p. 39).

Today, Patton's utilization-focused evaluation model (Patton, 2008) has found widespread application in environmental education programs involving the participation of various stakeholders (Carleton-Hug Hug, 2010; Crohn & Birnbaum, 2010; Patton, 1997).

The utilization-focused approach is explicitly geared to ensure that program evaluations make an impact (Patton, 1997; Patton, 1978; Stufflebeam, 2002). Utilization-focused evaluation can include any evaluative purpose, any kind of data, any kind of design, and any kind of focus. Utilization-focused evaluation is a process for making decisions about these issues in collaboration with an identified group of primary users focusing on their intended uses of the evaluation (Patton, 1997). The first step in a utilization-focused evaluation is identifying the stakeholders, or the primary users of the evaluation (Patton, 1997). They are the people who have a vested interest in the evaluation findings, and make decisions or express desires about the program. Moreover, identifying the stakeholder with a personal connection - labeled as the personal factor - is highly important, as it is these individuals who will use the evaluation findings to promote program improvement and effectiveness (Patton, 1997). To demonstrate the necessity of a personal factor, Patton (1997) illustrates this point:

> The personal factor represents the leadership, interest enthusiasm, determination, commitment, assertiveness, and caring of specific, individual people. These are people who actively seek information to make judgments and reduce decision uncertainties. They want to increase their ability to predict the outcomes of programmatic activity and thereby enhance their own discretion as decision makers, policy makers, consumers, program participants, and funders, or

> whatever role they play. These are the primary users of the evaluation. (Patton, 1997, p. 44).

The Director of Naturalist Training and UMD Associate Professor of Education serve as the primary stakeholders of the Wolf Ridge Student Teacher Program Since the inception of the program in 2004, both have invested time in continued support of the program. After ten years of implementation, both have expressed desire to evaluate effectiveness and impacts as described by past participants. The utility of the evaluation lies not only in the findings, but also in the processes that engage participants and stakeholders in systematically reflecting on their program (Patton, 1997).

Once primary stakeholders with a vested interest are identified, the next step in a utilization-focused evaluation is to determine the intended use. Three approaches to primary uses for an evaluation of a program are classified as: judgment-oriented, improvement-oriented, and knowledge-oriented. Within a judgment-oriented evaluation, the findings are used to determine accreditation or licensing and are typically summative. It also leads to cost-benefit decisions, and deciding a program's future. Improvement-oriented evaluations are formative, identify strengths and weaknesses of the program, and lead into management decisions of ongoing enhancement. The final evaluation approach is the knowledge-oriented evaluation, where findings are used to generalize effectiveness, extrapolate principles that work, and synthesize patterns reported by participants within the program. The approach of the utilization-focused evaluation of the Wolf Ridge Student Teacher Program falls under the knowledge-oriented evaluation approach, as it will contribute to general program effectiveness while revealing the principles of the program that may play into that effectiveness.

The purpose of this evaluative study is to provide the stakeholders with information regarding impacts of the Wolf Ridge Student Teacher Program as perceived by those participants who are currently teaching in a formal classroom setting, particularly addressing and defining instructional approaches utilized by these formal educators.

Chapter Three. Methodology

Introduction

This evaluative study investigated the outcomes and potential impacts of the Wolf Ridge Student Teacher Program through interviews with participants who have had either current or past experience teaching within the formal education system. The findings from this study were applied to guide future programming and effectiveness.

In using developmental evaluation, which is categorized under a branch of utilization-focused evaluation, the evaluator followed guidelines for this evaluation approach (Patton, 1978, 1997, Patton, 2011). As utilization-focused evaluation focused on the specific primary intended users for specific intended uses, developmental evaluation focused on program development as the sole intended use (Patton, 2011). After several discussions with the Wolf Ridge Student Teacher Program stakeholders, it had been determined that ongoing program development was one of the intended uses of the evaluation, which followed one of the main purposes for developmental evaluation (Patton, 2011). A second use, which had been expressed by both stakeholders, was the eventual marketing of the Wolf Ridge Student Teacher Program model to support and foster future university partnerships.

As one of the intended goals of the Wolf Ridge Student Teacher Program was to support formal educators, it was determined the best process to assess the Wolf Ridge Student Teacher Program outcomes was through collection of the perceptions of participants who are or were teaching in the formal classroom. By working with this select user group, this evaluation focused on the impacts of the Wolf Ridge Student Teacher Program on the teaching practices of past program participants who hold current

or past experience teaching within the formal classroom setting.

Purpose Statement

The Wolf Ridge Student Teacher Program had been in existence for ten years at the time of the evaluation, yet there had not been an evaluation of the program to determine its influence on participants. In addition, while outcomes were created as part of the program development process, these outcomes may or may not capture the range of what was actually being achieved following participation in the program, particularly when considered from the perspectives of participants. Thus, the purpose of this evaluation was to provide the stakeholders with information regarding impacts of the Wolf Ridge Student Teacher Program as perceived by former participants who hold current or past experience teaching in a formal classroom setting since completion of the WRSTP. Research questions were based specifically on how they perceived the program, its potential influence on their teaching practices, and what these participants had done regarding environmental education in the formal classroom.

Research/Evaluation Questions

The following research questions guided this evaluation:

1) What teaching and working experiences have past participants held since leaving the Wolf Ridge Student Teacher Program?

2) How do past participant perceptions on program outcomes of the Wolf Ridge Student Teacher Program compare with stakeholder perceptions?

3) How does the experience of participation in the Wolf Ridge Student Teacher Program influence participant perspectives as they relate to educational elements that include the learning environment, curriculum, teaching practices, and perceptions of environmental

education?

4) How have participants used or advocated for the use of program components within their formal classroom experiences?

Research Methodology

Within the utilization-focused evaluation approach, the main motivation for an evaluation study was to increase conceptual understandings of the potential influence of an experience (Patton, 1997). Thus the program and participant insight as it pertained to the essence of the experience was a main goal in the utilization-focused evaluation (Owen & Lambert, 1995). In this type of evaluation, it was paramount to guide the methodology by the evaluation goal, which was the intended use by intended users (Patton, 1997). Because this also followed the format of developmental evaluation, the primary use of the evaluation by intended users was ongoing program development (Patton, 2011), and potential marketing of the program model. The stakeholders and intended users of this evaluation included the Director of Naturalist Training at Wolf Ridge Environmental Learning Center, and the Assistant Professor at University of Minnesota-Duluth (UMD) that have coordinated and facilitated the program. Both are interested in learning the stories of these participants and the potential impacts the Wolf Ridge Student Teacher Program had on their teaching practices within the formal classroom. Both stakeholders were also interested in ongoing development and improvement of the program. Patton (2011) provided five approaches from which to base the primary purpose and use of developmental evaluation. These five approaches to evaluation in program development gave a lens from which to understand and engage in evaluating socially innovative programs, such as the Wolf Ridge Student Teacher

Program. Although ongoing development was a purpose of this evaluation, combinations among all five approaches were possible and a single program may have engaged more than one purpose at the same time.

In addition to ongoing program development, a subsequent use of the evaluation as the presentation of the Wolf Ridge Student Teacher Program model to future university partners and non-formal environmental education institutions. It was through the information provided within this study that both stakeholders hoped to promote such a model to committed organizations in the field of environmental education and other university teacher preparation programs. Although this could be considered preemptive, it was vital to state all uses by stakeholders as they were seeking evidence of program effectiveness that lead into this second intended use.

As the aim of the Wolf Ridge Student Teacher Program was to bridge the gap between formal and non-formal settings through various instructional approaches, the collection of descriptive accounts from past participants currently teaching within a formal classroom informed the stakeholders on this programmatic aim.

To illuminate the complexities of potential impacts of the program, in-depth qualitative interviews were conducted with each participant who was a formal educator at the time, or had been a formal educator in the past, and had completed the Wolf Ridge Student Teacher Program. Qualitative interviews were the chosen data collection method as the interest of the stakeholders was in understanding the influence of the Wolf Ridge Student Teacher Program experience on those who had completed the program. Interviews lent themselves to capturing the deeper meaning of that experience and the relationship to instructional methods used within the formal classroom. Moustakas (1994)

defined this form of interview as a phenomenological approach, with the core basis as exploring the essence of a lived experience. Therefore, the interviews were conducted from a phenomenological standpoint, but data was analyzed from an evaluative standpoint. There were also issues of reliability issues present in the small-sample interview design. Therefore, this study was not meant to be generalizable beyond this specific program.

The qualitative interviews in this study followed the elements of the interview guidelines provided by Seidman (2013). Although Seidman (2013) requires a sequence of three interviews to expand the meaning of the experience, due to time, the evaluator conducted only one interview. Following Seidman's guidelines, interview questions were explorative and open-ended in nature, and avoided leading questions. To ensure consistency among interviews, an interview guide was followed by the evaluator and served in gathering the same categories of information across all participants. To keep with the flow of stories, the guide was "designed to ask participants to reconstruct their experience and to explore their meaning" (Seidman, 2013, p. 94). Therefore, the interview guide was used to provide direction but written in a thematic way to allow openness in responses framed around the four research questions. Themes within these questions included: current perceptions of the formal classroom through teaching experiences; teaching philosophy and pedagogy regarding educational elements of the learning environment, curriculum, teaching practices, and environmental education; and the potential influence of the Wolf Ridge Student Teacher Program on these educational elements. The use of these themes provided focus to each interview. The interview guide can be found in Appendix D.

A limitation to this interview approach was the lack of verbal question consistency, which caused interviewees to respond inconsistently (Turner, 2010). To combat this limitation, the interviewer worked with the participants in giving a clear direction of the purpose of the questions as based on the nature of the study and interview guide prepared. Information was provided to the participants prior to the start of the interview to provide the context and framework of the study (Patton, 2002) and can be found in Appendix E.

Description of Participant Experience

Since it began in 2004, the Wolf Ridge Student Teacher Program had provided environmental education teaching opportunities to nineteen individuals, averaging two student teachers per year. Three universities across Minnesota had partnered with Wolf Ridge ELC having student teachers participate in this program.

Of the nineteen individuals participating in the program since 2004, twelve participants had gained formal experience teaching within kindergarten through grade twelve classrooms. As the purpose of the developmental evaluation was to investigate potential influences of the program on teaching practices, those individuals that had completed the Wolf Ridge Student Teacher Program provided greater insight into overall impacts of the program. Through the shared common experience of the Wolf Ridge Student Teacher Program, the participants illuminated potential influences of past experiences on their teaching approaches.

A variable that potentially affected participants' teaching practices was the length of time and experience as an educator within the classroom. An educator with ten years of formal teaching experience as compared to an educator with two years of formal

teaching experience did cause variations in the data, among other variables such as classroom, school climate and other past experiences. Length of time as a formal educator was addressed within the individual interviews as well as further description of outside experiences between the completion of the Wolf Ridge Student Teacher Program and their current formal position.

Researcher and Stakeholder Beliefs

Due to the nature of developmental evaluation, Patton (2011) acknowledged the necessity to bracket beliefs the stakeholders and evaluator may hold concerning their presuppositions of the program and perceived outcomes. Hycner (1985) also suggested this method as a way to ensure interpretations were based upon the participants interviewed, not on interpretations of those directly involved in the evaluation outcomes. "A good check on whether the researcher has been able to bracket their presuppositions is for the researcher to list these presuppositions that they are consciously aware of as well as to dialogue with their research committee about these presuppositions. Such dialogue may very well bring out presuppositions that the researcher was not consciously aware of" (Hycner, 1985, p. 281). Therefore, to ensure that the interpretations based from the evaluator and stakeholders did not interfere with participant interpretations during data analysis, the evaluator outlined her personal beliefs, and the stakeholder's beliefs, concerning the perceived outcomes of the Wolf Ridge Student Teacher Program.

Beliefs of the Evaluator. The evaluator acknowledged the potential for biases in this evaluation due to her relationship with the Wolf Ridge Naturalist Training Program. In addition, her teaching background in elementary education and formal classroom teaching experience could have influenced her perception of answers given by the

participants. Therefore, discussion of participant experiences could have caused association to her own personal experiences in the classroom and at WRELC. The evaluator graduated with her teaching license in 2009 and held various formal teaching positions until her participation in the Wolf Ridge Naturalist Training Program in 2012. Her participation in the program lasted from 2012 to 2014.

Due to her background within both settings, the evaluator perceived great value regarding effective skills in the teaching practices learned at WRELC and how these skills could be applied within the formal classroom. Through her use of experiential education and practice in lesson development and execution during her two years at WRELC, the evaluator predicted greater strength and confidence in taking students outside and introducing environmental education in all classroom settings and subjects. Because of conversations with past student teacher participants during her personal participation in the Wolf Ridge Naturalist Training Program, she perceived the use of experiential education as an effective teaching strategy that gives greater depth to learning through relevancy in everyday life. In addition, she foresaw possible challenges to incorporating such strategies in environmental education due to her own background in the formal classroom. These challenges could be affected by lack of administrative support, lack of political support due to expectations of state standards, and lack of time. She believed that as a result of participation in the Wolf Ridge Student Teacher Program, individuals had the confidence to overcome these challenges and instigate what they deemed as best practice for student learning.

Beliefs of the Wolf Ridge Director of Naturalist Training. As the Director of Naturalist Training and co-creator of the Wolf Ridge Student Teacher Program, Joe

Walewski was deeply invested in the results of this evaluation and the stories of provided by the participants. Regarding beliefs about the impacts of the Wolf Ridge Student Teacher Program, Walewski stated, "I think that more and more, as our teachers leave Wolf Ridge, the retention of facts is less and less important to them… and story creation is more important. I think they leave here with a confidence that they can help students create meaningful stories" (Personal communication, February 13, 2015). Stories told by the participants could be integrated across all subjects, "…those stories come out whether it's in English class, or science class, or math regardless of the grade. I think that happens more regularly. I think that rather than just saying the facts louder, or more often, I think that these teachers routinely depend upon story and it starts to become a habit for them" (2015). As a way to meet challenges, Walewski also believed that many participants "do not always follow the rules" and eventually act upon what they deemed as successful teaching practices. "For some it may be several years of their own personal experience before eventually their teaching practices mature and evolve to be the most successful" (2015). Ultimately, Walewski believed that the Wolf Ridge Student Teacher Program "broadens people's perspective on what education can be. I think we've just given them a broader perspective on what's possible" (2015).

Beliefs of the University of Minnesota Duluth Assistant Professor of Education. Also as co-creator of the Wolf Ridge Student Teacher Program, Kevin Zak held a different role. Because of his relationship to the student teachers as acting supervisor, observing the student teachers twice in their formal placement, he held the responsibility of overseeing that the state and university requirements were met before the student teachers could graduate. In addition, he also facilitated reflections given by

student teachers as they made connections between the two different teaching settings. “I have a fairly good understanding too of what they know from our teacher preparation program, both elementary and secondary, since I teach in both of those programs. I can leverage that knowledge and have them think about that information as it pertains to their experiences, or what I’m seeing them doing in classes that I’m observing them teach. I can tie it back to things I know that they’ve experienced at Wolf Ridge” (Personal communication, February 12, 2015).

When asked concerning personal beliefs of what the experience of participating in the WRSTP provides, he believed the program was providing the knowledge and skills to connect methods used between the non-formal and formal settings. “Because we know through research that teachers tend to teach the way that they’re taught. Maybe they’ll [student teachers] think a little differently about what they’re doing in their classroom and with their own students” (2015). He had witnessed from past evaluations a general shift from teacher-directed approaches to more student directed approaches, an increase in the skill of questioning to assess student learning, and an overall creativity in how to teach a concept to facilitate the most effective student learning.

Although their supervisory roles were different, Zak envisioned similar outcomes to Walewski, in reference to using experiential education and taking students outside in the formal classroom settings.

Procedures

All individuals participating in the study were informed of the purpose of the study through a consent information sheet (Appendix F). Most interviews took place through phone and Skype due to the participant’s current location and feasibility of travel by the

evaluator. One of the interviews was conducted in person, and took place at a location suggested by the interviewee and confirmed by the evaluator. The location was documented.

The interviews were tape recorded by the researcher. The interviews were transcribed and checked again for accuracy after the first transcription. Handwritten notes were taken during and immediately following the interview to accompany the tape recordings and provide additional descriptions. All interviewee information was kept anonymous and stored with the use of pseudonyms assigned to each individual interviewee.

Data Analysis

The transcribed interview data was studied according to Hycner's method (1985) of analyzing phenomenological interview data. The procedures were originally written to conduct two interviews. Therefore, the analysis procedures were adjusted to meet the interview procedures of this study. First, the interview audio recordings were transcribed. After transcription, the bracketed beliefs of the evaluator and stakeholders were reviewed before searching the data for meaning to ensure the participant's interpretation of the outcomes and not the evaluator's interpretation. Next, the evaluator listened to each interview several times to gain a sense of the whole picture. After listening and reading through the interviews more than once, the evaluator reviewed every phrase, sentence and paragraph to derive participant's general meanings. This was done with as much openness as possible and at this point did not yet connect the research question to the data. Next, the evaluator was ready to assess the research question to the general meanings derived from the interview data to determine whether participant statements responded to the

research question. If the response appeared to do so, it was then noted as a unit of relevant meaning. The evaluator also noted the actual frequency a unit of relevant meaning was listed. The evaluator searched for common themes among the units of relevant meaning and clustered these themes. From this list of common themes, the evaluator determined if there was one or more central themes that expressed the essence of the clustered themes. Once verified, the evaluator looked for general themes common across all or most of the interviews, taking note of individual unique themes that could be counterpoints to the general theme. Once general and unique themes had been noted, the themes were placed back into the overall context of the study. A composite summary was written of all the interviews to capture the essence of impacts of the Wolf Ridge Student Teacher Program as they related to the research questions, and are reviewed in chapters four and five.

Chapter Four. Results and Discussion

Introduction

The following chapter presents the results from participants who have held or are currently holding a formal teaching position that have participated in the Wolf Ridge Student Teacher Program. Of the twelve past participants, the evaluator interviewed only eight participants, as the four non-participants could not be reached. Interview times ranged from 45 minutes to 2 hours and were recorded via audio recorder. Seven of the eight interviews took place over Skype, and one interview over the phone. The interview guide used in these interviews can be referenced in Appendix D.

This chapter uses the four research questions to present the evaluation results, with the evaluation questions sub-grouped under each research question. The evaluator used Microsoft Office Excel to code and assign emerging themes to interview statements made by participants. Although themes did emerge in frequency as a pattern among participants and were noted, individual statements were also accounted for in the results as the stakeholders requested all evaluation data to be presented.

This chapter shows the patterns and notable individual statements emerging from participant responses. These results are then compared to statements from stakeholders concerning outcomes of the Wolf Ridge Student Teacher Program in chapter five.

Participants' Teaching Experiences

Introduction to Participants. Formal teaching experiences of the participants varied from 10 years to 6 months. Participants' teaching experiences also varied between public, private, and charter schools. The following sections share the past and current work experiences of each participant, starting with Kelly who had held the longest length

of time in a formal classroom (ten years) to Ellie who had held the shortest length of time in a formal classroom (6 months). In addition, school setting factors, such as teaching schedule, curriculum, and classroom descriptions, from each participant are presented to provide context.

Kelly. After leaving the Wolf Ridge Student Teacher Program, Kelly took a position as a public high school teacher and has been teaching at the same location for ten years. Although her classes do switch depending on student interests, administration and scheduling, she is currently the biology and anatomy teacher. Kelly specifically teaches biology and accelerated biology to sophomores, and anatomy, physiology, and nature studies to juniors. Her schedule follows the more "traditional" schedule of schools, teaching six sections of science per day, with 3 sections to sophomores and 3 sections to juniors, with each section lasting 45 minutes, and approximately 30 students in each section. She follows the Minnesota Science Standards when creating her curriculum for the year, with topics including ecology, bio-chemical cycles and food chains, structure and function of cells, cell division, photosynthesis and cellular respiration, genetics, and bio-technology lab work where she will take students to a local lab to conduct DNA testing. When asked about the layout of her classroom, she reported that she was presented with the opportunity seven years ago to redo the layout of her classroom to her specifications. She now has fifteen tables seating two students per table and seven lab stations with a computer at each. Kelly expresses the rationale for this arrangement, "So I can arrange my tables in a variety of different formats depending upon what we are doing." She goes on to state as to why she chose that particular set-up, "I think that

students learn in lots of different ways and having flexibility in the way that they are arranged can offer a lot of opportunities for various types of work."

Michelle. After leaving the Wolf Ridge Student Teacher Program, Michelle is now going on her 9th year at a charter school, stating it as “a beautiful little country school, surrounded by these lovely woods, and a little creek, and fields.” Classes are multi-age, and she teaches to ten 2nd graders and ten 3rd graders within an integrated classroom, with a total of 20 students in her class. She describes the school’s philosophy as “progressive education”, promoting “emergent learning” where the students’ interests, needs and development guide the curriculum. Environmental learning is a focus as a whole at the school, and is promoted by the teachers in the curriculum and classroom daily. In following with the school’s philosophy, Michelle’s schedule follows a more “non-traditional” route, with a strong focus on building student and teacher community. She labeled this format as “responsive classroom,” where students will develop classroom rules and the teacher is the upholder of the rules. Also, students have workers’ choice, choosing when to do and complete specific school work following a timeline set by the students and teacher. The students still receive education in all school subjects, but in a less structured, more thematic, cross-curricular and student-directed format. As topics are dependent upon the students and taught thematically, often science is the umbrella with environmental learning as the focus and main interest for the students. Michelle states, "Even though we don't have a specific science curriculum, we do really well in science because they're living and breathing science all day long.”

Richard. Richard had nine years total working within the formal education field. After leaving the Wolf Ridge Student Teacher Program, Richard taught 5th grade for one

year at a public school. Afterwards, he accepted a position at a school first as a 5th grade teacher for half of a school year, then moved into the position of Title 1 Specialist for 6.5 years. He is currently a K-7 Assistant Principal at for a public elementary and middle school working with 700 students total.

When teaching in the formal classroom, Richard followed the state standards, but adapted much of the curriculum to fit his style of teaching, often making it cross curricular and based in student interest, although he did follow a more "traditional" classroom format. "Pick and choose what standards to focus on first, decide what the kids should know at the end of the year, and choose what makes sense to build upon the next stage. I made a point to build social studies in because it is untested in most places…and I would choose books that related to both social studies and what we were learning in science."

Tim. Tim has been teaching in the formal classroom for seven years. After he left the Wolf Ridge Student Teacher Program, he accepted a position at a private school. As the only science teacher in the school, he taught to every grade, 6th through 8th grade. After two years, he moved to teach at a public school as the science teacher for 6th through 9th grade for the first year, then 6th and 8th grade only for the next three years. He currently teaches at a public school focusing on 6th grade science only. Following a more traditional school schedule, Tim teaches 5 sections of science everyday, with 30 students in each section. Following the Minnesota Science Standards, topics focus on physical science and earth science, with introductions to chemistry and physics. He formats his lab instruction to reflect a more inquiry-based approach, "where they [the students] have to

figure it out." He also incorporates think-pair-share strategies among students on more content-heavy days, to promote community within his classroom.

Donna. Donna has worked in the formal classroom for four years as a 6th grade science teacher. After leaving the Wolf Ridge Student Teacher Program, she taught in a public school. She now teaches at a public school, teaching 5 sections of science, with 20 students per section. She brings “a lot of what I learned at Wolf Ridge – like how the classroom was set up - like in my science classes for a day I would teach the concepts and the next day I would do a hands-on experience with them." Her schedule does follow a more “traditional” schedule with a certain amount of time spent for each section of science. Donna created her own physical science curriculum using the Minnesota State Standards. She incorporated topics such as units of math, physical and chemical changes, different forms of energy, Newton's three laws of motion, light waves and sound waves, convection, conduction, and radiation. Her latest lab involved experimenting with mirrors and reflections using lasers. Donna incorporates technology as much as possible into her teaching, often using YouTube videos for instruction and facilitation. "The reason why I use that [YouTube] is because sometimes kids don’t understand what I’m trying to say. So I’m trying to put a different perspective in there. Or trying to explain it a different way." She incorporates a more student-centered approach to her classroom, often with small group work, or giving individual freedom and time to pursue a topic more.

Sarah. Sarah has completed her first year as a 6th grade English Language Arts (ELA) and Social Studies teacher at a public school. Prior to her formal teaching experience, and after leaving Wolf Ridge, she gained a variety of non-formal teaching experiences, first at a bilingual school in Honduras, then she moved to Holland to nanny,

and then she taught at an outdoor school for two years before accepting her current formal teaching position. She describes her current workplace as “a very traditional school,” where she teaches 3 block classes, 1 hour and 15 minutes each, with 20 students as average in each block. She follows the curriculum guide the school provided, and uses McGraw-Hill as text, which is primarily ELA focused. Reading topics taught include reading strategies and skills, plot structure and understanding story development, and different genres of literature. Writing topics include a writer's workshop where a prompt is given. The students create a first draft, second draft, edit, and then write a final draft for a grade. Different writing styles explored are persuasive writing, compare/contrast writing, non-fiction writing, autobiographies, and research project with steps of research such as collecting and organizing notes, writing a thesis, and works cited. Sarah strikes a balance between reading and writing, and often adds an experiential element to the writing process. For example, she uses the final activity of "Far North" by Will Hobbs as a reenactment for a reading enrichment group where the students apply the story of survival themselves while they are outside.

The school is regarded as a high poverty school, with many behavioral issues and students with special needs. She adapts her classroom setting to reflect a home with houseplants, tablecloths, and pictures of students in frames hanging from mobiles from the ceiling.

Mike. After leaving the Wolf Ridge Student Teacher Program, Mike substitute taught both in a public high school and elementary school for a short period of time. He also worked part-time at a Nature Center as the Animal Care Coordinator and Naturalist, and part-time at a zoo as a Summer Naturalist. He accepted the position at a non-profit

school for twice exceptional students, as the science teacher for all grades, 3rd through 7th grade. The school follows a "non-traditional" schedule and classroom format, as each student is with gifted needs and with one or more learning disabilities. Mike's classroom format follows his students' needs rather than the set curriculum typical of a more "traditional" classroom format and schedule. ADHD, dysgraphia, and dyscalculia are the most common disabilities, alongside Emotional and Behavioral Disorders (EBD). It is a small school, as Mike started with four students initially, he now teaches eight students with a 4:1 ratio. Students are paired by individual academic level and learning patterns, such as the three 3rd graders and one 4th grader for one section of science; then three 6th graders and one 7th grader are grouped together. Two of the 6th graders share similar learning patterns are sub-grouped together and follow more Minnesota Science Standards with additional challenges, and one 6th grader and one 7th grader are sub-grouped together as they are more project-oriented. Mike states, "It feels more like homeschooling." Overall, he follows a project-based approach, using standards to inform the curriculum, but has to make it challenging as the students make "easy" connections quickly. "So we would be all the way through. Because of that giftedness, we would have finished all standards in the first two weeks I would say, but the disabilities are what take knowledge and examples or proof of knowledge." Regarding topics, Mike focuses on life science for 3rd and 4th grade, and physical science for 6th and 7th grade but with different emphasis. For example, the 6th grader is focusing on light in physics and the 7th grader on genes and hereditary.

Mike teaches his two sections of science throughout the day, and is responsible for other parts of the student schedule as well, such as morning break-time and the 1-hour

walk outside to decompress and "connect beyond whatever the subject is that we teach." He also introduced a segment of time called "Care of Living Things" where students are in charge of care for the 12 animals present in Mike's classroom for 20 to 30 minutes everyday. Each student is responsible for at least one animal. He also is in charge of an afterschool program that incorporates greater depth and additional opportunities for the care of the animals, and free-time.

Ellie. After leaving the Wolf Ridge Student Teacher Program, Ellie substitute taught for several years. She then accepted a position as a 7th and 8th grade social studies teacher at a public school, beginning mid-semester in January. She classified the school as low-income, with many students homeless. Little expectations or guidelines were set for the students in regards to discipline, stating what was available in terms of a plan as inconsistent and ineffective.

Ellie taught 8th grade US History and 7th grade World Geography. She followed a more "traditional" schedule and classroom format, with 3 sections of each class, and approximately 20 students per section. She revised her own curriculum using the Minnesota Academic Standards and used a station-based approach, "which is kind of difficult to complete in a middle school setting. Just like physically the classroom isn't very conducive to that but I tried to move it as much as student centered as I could." For example, she incorporated stations into her Geography class focusing on a different region every week, with tasks assigned at each station. To signify a station has been completed, the students would receive a stamp in their individual passports. "But, there were moments where like stations and student center stuff was not working. Like relying on them to teach themselves about certain aspects, just like wasn't effective." When asked

to classify an overall percentage of student centered vs. teacher-centered regarding her instructional format, she stated, “60% student-centered, 40% teacher-centered."

Ellie left the formal teaching sector after six months of teaching and accepted a full-time position as an educator and volunteer coordinator at an aquarium.

Opportunities for Teaching Outside. Participants were asked if they had the opportunity to take students outside during class time. Of the eight interviewed, seven reported taking their students outside during class time to conduct a lesson, enhance learning within a lesson or unit, or for social development. For example, Richard took his 5th grade students outside during math to study circle circumference and Pi. He had his students find and measure circles in the school playground area. In addition, as a means to study the Protestant Reformation in History class, he had his students physically draw maps outside using chalk and outline the boundaries of the catholic and protestant schism. When asked why, he replied, "If you physically engage, that helps mental engagement. So, you know, that comes from undergrad; it comes from Wolf Ridge; it comes from my master’s program; it comes from just classroom experience." Kelly created and serves as chairperson of the School Forest Committee to promote more use within their school forest and within the school district. "We continue to look at ways to get more teachers to bring kids outside." She created School Forest Learning Days where she had her high school students mentor visiting K-5 elementary students in the skills of using map and compass and nature exploration. "We were able to get every single elementary student from K-5 outside for two days and we are continually looking for more ways to make that happen."

Of the seven who shared examples of taking their students outside during class time, two reported taking their students outside on a frequent basis, meaning more than once in a unit of study. Michelle takes her students outside nearly everyday for both social development and enhancing a lesson or theme she is focusing on that week, "I definitely think that kids need to be outside...They need to smell different smells, and experience different weather on them. I am outside almost every day." Sarah takes her students outside to read, write, and conduct lessons. “I do take them outside a lot too just to like be outside, you know, fresh air, read silently on the lawn."

Some of the barriers to going outside shared by participants included lack of proper clothing, weather, relevancy to the lesson, lack of support from co-workers and overall school culture. All of the teachers interviewed stated that they would like to take their students outside more, but as Richard states, "Being the new teacher, and that's not the culture at your school, that's a hard thing to do on your own."

Participants’ Perceptions of Effective Learning

Effective Learning. When asked the question, “What makes for effective learning?” participant answers varied, but many responses were connected. The evaluator categorized their answers into two broad themes, with sub-themes labeled. Some participants stated more than one means for effective learning in the classroom; therefore, participants may be repeated within these different themes. Each theme is outlined below.

Social and Emotional Buy-in: Building Rapport and Meaningful Learning. One participant, Mike, labeled the term, “buy-in” as a means to connect with his students on a personal level, which can then lead to greater academic learning. As he describes it, “Social and emotional buy-in gives the impression that school is a place that they want to

be, or school is a place where good things happen. They need to feel like they want to be there. I think lots of kids can masquerade that they have accomplished something, but if it doesn't mean anything to them, if they don't have any emotional connection to it, I don't know if it's a thing they did one time."

Because this statement is broader to include both building personal connections to students and creating emotional connections for students to academic content, it encompasses two sub-themes: building rapport with students and relevancy for meaningful learning.

> Similarly, Kelly stated building rapport as one of her main means for effective learning: …what I try to do is just find a way to connect with them outside of their content area so that we have a relationship I guess, and so they can see that I care about them as people as much more as I care about what they are learning in my classroom. Sometimes that's effective in kind of breaking that barrier and getting them to start doing something and other times it's not.

Richard, Tim, Mike, and Ellie expressed that they use building rapport in a similar fashion to Kelly as a means for effective learning.

Relevancy for meaningful learning refers to connecting academic content to students' lives to build personal value. As one of the leading means for effective learning, Tim stated:

> …applying [content] to their [students'] everyday lives is very important. So they see relevance. I have a lot of students that, if they don't think it's important they don't care about it at all, especially if they don't see how it affects their everyday

life…it's something that they have to see value in, that they need to see what the value actually is.

Tim, Richard, Mike, Sarah, and Kelly also stated relevancy and meaningful learning as a means for effective learning.

Within this theme of buy-in and sub-theme of building rapport and relevancy for meaningful learning, five of the eight participants have expressed this as a firm foundation for effective learning.

Using Different Approaches for Different Learners: Types of Learning. Seven of the eight participants stated using different approaches for different learners as a means for effective learning in the classroom: Mike referred to having to be flexible as a teacher for his twice-exceptional students, often taking student interest over a more standardized approach when helping to facilitate a student project. Donna uses YouTube videos in her classroom to reach more visual learners, and promotes more social experiences in small groups to explore lessons in different ways. She also will organize her classroom to reflect a more hands-on experiential approach. Sarah will vary her teaching approaches based on student engagement. Ellie used her station-based approach because, "...some people learn when they touch, and some people learn when they write and then they color, and so just trying to understand that everyone in your class is coming from a different - there are all different types of learners."

Three similar approaches to student learning (inquiry-based learning, project-based learning, and experiential learning) emerged as a common element of instruction used by participants. Michelle stated experiential learning as her main means of effective learning because "that's the kind of learning that really cuts to the core." When learning

aspects of ancient Greece with her 2nd and 3rd graders, she immersed them into the world of ancient Greece by giving them roles of that era and having the students create their own examples of drachma to purchase in markets the students built for themselves. When Tim spoke to using an inquiry-based approach, he stated, "I feel like having students doing things is way more effective than just talking about it. They have to figure it out, so they're actually turning on the flashlight and realizing that it's going from that chemical energy in the battery, to the electrical, to the heat energy, and the light energy and this…the process of doing things makes it stick a lot more, and applying it to their own life."

Influences. When asked how participants had come to know these means of effective learning, three participants specifically stated that they learned it from participating in the Wolf Ridge Student Teacher Program. When asked how Kelly came to know her means of effective learning, she replied, "Experiences, observations, Wolf Ridge." She then broke it down into separate experiences, starting with how she first connected with her own high school teachers, then through practice at Wolf Ridge, and now practicing within her current role as high school teacher. Mike also stated how his personal experience at Wolf Ridge served him in recognizing his goals to meet target audiences.

> And so I think that my experience in teaching [at Wolf Ridge] has set me out to be very aware of who my people are in the room and who are going to be a part of class that day. That was just something that was done purely out of survival when I started teaching at Wolf Ridge, because you have to do this [concept] otherwise there's so much that you can do.

The remaining participants stated influences from other past experiences and their own personal philosophies. When asked how he came to know his means for effective student learning, Tim directly stated, “You figure it out over time.”

Participant’s Ideal Teaching Environments and Barriers

Ideal Teaching Environments. Participant’s shared their ideal teaching environments and the barriers most often confronted between making the ideal a possible reality within their current teaching situation. The evaluator sought to determine any patterns towards one or more ideal teaching environment(s) among those that were shared. The themes that arose are grouped under three major categories: physical settings, curriculum, and logistics, and are outlined in Table 3. A more in-depth explanation to each of the subthemes is provided following Table 3.

Table 3: Characteristics of Ideal Teaching Environment(s)	**[/8]**
Physical Settings	
Better Access to the Outside	**6**
More Classroom Space	**3**
Curriculum	
Project-based Education	**3**
Interdisciplinary Connections	**3**
Teacher Independence	**2**
Logistics	
More Time	**2**

Note. Participant numbers are out of eight, written as [/8].

Table 3: Ideal classroom settings grouped into themes and subthemes as stated by eight of the participants. Most participants stated more than one subtheme, attributing to numbers exceeding eight.

Physical Settings. Participants expressed the need for better access to the outside through a door directly from their classroom to use at any time, more windows physically available to allow for more natural light, or access to more meaningful outdoor spaces that reflects a forested area rather than a parking lot. Participants emphasized more classroom space as ideal to physically move around the room, promoting more social interactions both as small groups and a whole group.

Curriculum. Project-based education was stated as the ideal learning format to use in the classroom by several participants, with many referring to the teacher as the facilitator. Within this format, more of a focus for environmental and nature-based education was strongly emphasized. To provide an example, Kelly stated "…when kids are out getting their hands dirty in the environment, I think that they are more likely to see connections and to get engaged and to kind of grasp on two concepts and potentially have a greater depth of learning". Interdisciplinary connections referred to connections within the curriculum, although one educator emphasized building connections among teaching staff at her school to emphasize connections within her classroom. Participants stating "teacher independence" as a subtheme referred to being bound by state standards, with student accountability being emphasized over teacher effectiveness and an efficient learning environment.

Logistics. In reference to "more time", participants preferred a longer block of time to make more meaningful connections for their students within the content they teach. Both of these participants have a 45-minute block schedule at their current school.

Barriers to Ideal Teaching Environments. A follow-up question was asked concerning what barriers inhibited participants from making their ideal teaching

environment a reality. These barriers were grouped as themes and listed in Table 4, with an in-depth explanation provided in the following paragraph.

Table 4: Barriers to Ideal Classroom Settings	**[/8]**
Lack of Time	**5**
Standards and Testing	**5**
Liability and Safety	**2**
Funding	**2**
Small Classroom Space	**2**

Table 4: Barriers to ideal teaching environments included only logistical barriers. Most participants stated more than one barrier, attributing to numbers exceeding eight.

Lack of time was stated as a major barrier to their ideal teaching environment. Every participant either referred to their desire to go outside more but with little time, or lack of time to explore classroom concepts more meaningfully. Standards and testing were also stated as a barrier to exploring a more interdisciplinary curriculum and/or a project-based learning format. Liability and safety issues were mentioned when wanting to teach outside, or with equipment that would allow for greater depth of understanding. Funding was mentioned as a barrier to creating a deeper learning experience. For example, Sarah would like more field trips off campus but with little financial support from her school, she is unable to provide that for her students. Additionally, a physically small classroom space size hinders social interactions among small groups and students as mentioned by some participants.

environmental education: Definition and Realization

Participants were asked to share his or her personal definition of environmental education. This question was used to serve not only as the transition from their current teaching situation to their past experiences in the Wolf Ridge Student Teacher Program,

but as a means to provide the evaluator with a sense of what each participant means when stating environmental education, and whether it is realized in their classroom. The definition of environmental education fell under these three themes:

- Making Connections Between Students and the Environment
- Observing and Experiencing
- Creating Awareness

Six participants provided responses related to *Making Connections Between Students and the Environment* as a goal of environmental education, with statements to help students understand interactions between the outside world and the role of humans in terms of impact and preservation. Five participants stated *observing and experiencing* as a means to learn about the outdoors; three participants who stated the first theme added this definition as a means to make connections between students and the environment. Two participants stated environmental education *creates awareness* to inform humans on how to live.

When participants were asked concerning the importance of environmental education within school curriculum, six of the participants stated environmental education should be taught in the school curriculum. The other two participants, Mike and Kelly, stated, "Only where environmental education applies in the curriculum, as not all topics fit."

Only one participant, Michelle, realized environmental education in her curriculum on a daily basis. This may be due to her school culture as it was built into the mission statement. The other participants incorporate environmental education where applicable within the curriculum, such as within a recycling unit or ecology unit. Four of

the eight participants stated that although they do not incorporate it on a frequent basis, they do have side conversations about environmental education with students, such as when Tim talks to his class regarding climate change after taking temperatures during a weather unit. Other participants faced additional challenges when attempting to incorporate environmental education, such as Richard who was limited by a lack of resources to include environmental education on a more frequent basis. Sarah was challenged by a lack of support from her co-workers, although her principal was supportive of her attempts to include environmental education in class projects. Ellie struggled to incorporate environmental education into any side conversations or lessons due to an emphasis on academic standards and lack of connections within the curriculum.

Participants' Perspectives on the Wolf Ridge Student Teacher Program

Participants were asked to share their opinions regarding their individual growth after their participation in the Wolf Ridge Student Teaching Program, and how they would apply that growth to their teaching methods today.

Teaching Methods. Through evaluations with Joe Walewski, and through the mentorship of other program naturalists, every participant stated that the Wolf Ridge Student Teacher Program introduced them to other teaching methods through a variety of ways. Donna, Michelle, Sarah, and Ellie strongly identified their preference for an experiential learning environment as being rooted in their experiences at Wolf Ridge Environmental Learning Center. Michelle states,

> Wolf Ridge is about environmental education, but it's also about experiential education. And it's also offering this incredibly unique capsule of life experience for a child…I think Wolf Ridge really helped me see the value, the beyond value -

> in those things. That it's not just about learning about the environment. Wolf Ridge helped me see beyond just the academic portion of it [education].

Likewise, Donna stated,

> And I did bring a lot of what I learned at Wolf Ridge - kind of the way the classroom was set up - into my science classes. So for a day I would teach the concepts and the next day I would do a hands-on experience with them. And the instructional methods [from Wolf Ridge] I still use, because the first 45 minutes you learn, and then you go outside. So you experience it, and I've done that, and I do more now progressively with it than just throwing a bunch of information at them and expecting them to know it all the time. So now that's part of their format that I used, and I still use it because I really enjoy that part. For me it's not lecture, for me it's learning.

Social Learning and Relationships. An emphasis on social learning was another theme that emerged as Mike, Donna, and Ellie all stated student ownership in learning was an important component in their classroom. Building rapport with students was also labeled as important and Mike, Richard, Kelly, and Donna all have attributed their skills in building relationships with students to their experiences with the Wolf Ridge Student Teacher Program. Similarly, Sarah, Tim, and Kelly also highlighted the importance of developing community within their classroom as a key to building student relationships not just between teacher and student, but from student to student. They each stated learning this concept from their participation in the Wolf Ridge Student Teacher Program.

Comfort in Teaching. Tim and Ellie both stated that the Wolf Ridge Student Teacher Program helped them develop an overall comfort level in teaching. Kelly, Michelle, and Sarah expressed a greater comfort to teaching outdoors due to their past participation in the program, and bring their students outside when schedules allow.

Shift in Outlook on Education. Four participants stated that due to their participation in the Wolf Ridge Student Teachers Program, their perceptions of the field of formal education shifted, either from positive to negative, or vice versa. Three of the participants stated their unwillingness to enter into the field of formal education, preferring to seek a position as a naturalist, outdoor educator, or environmental educator after completing the WRSTP. Michelle, the other participant, had the opposite viewpoint. Her participation in the program drew her closer to the formal education field, preferring to foster a more long-term relationship with students. She related to the week-long school visits as "not enough time to get to know the students" during her participation in the Wolf Ridge Student Teacher Program, and that pushed her into the elementary teaching position she holds now.

Participants' Ideas for Improving the Wolf Ridge Student Teacher Program

Participants were asked to share their opinion if any major pieces were missing from the Wolf Ridge Student Teacher Program that could improve the effectiveness of the program. Seven of the eight participants contributed feedback to program improvement, with the feedback falling under two categories:

Assessment. Mike, Ellie, and Sarah all stated that they would have preferred more practice in setting up assessment in a non-formal environment. Sarah related particular trouble in creating assessment for her students currently as she wants to

incorporate more experiential learning, but the assessment within her school curriculum does not match the objectives of her lesson.

Stronger Connections between Formal and Non-formal Classroom. Kelly, Michelle, Richard, and Tim all stated a stronger connection between formal and non-formal setting was needed. Richard would have liked to know how to bring the outdoors into his formal classroom better and vice versa as the subjects, materials, and lesson structure are in different formats and methods. Tim and Michelle would have preferred more formal education opportunities in teaching outside of the program and closer to Wolf Ridge ELC. Kelly stated how alone she felt when she was away for her classroom teaching, feeling like she "was on an island with no connection." Kelly, Sarah, and Richard all alluded to having a staff mentor or advisor available to connect the two experiences through feedback and evaluation would have created a more lasting impression and easier transition between teaching in a formal setting and a non-formal setting.

Conclusion

In summary, participants held a variety of different teaching positions, with the school culture varying from one individual to the next. School schedules and classroom formats varied between a more "traditional" and "non-traditional" classroom setting, but even with classroom formats often dictated by logistical barriers such as lack of time or administrative support, most of these educators still found time to take their students outside, with every educator expressing the desire to teach outside more. When it comes to effective learning, most participants leaned towards more social and emotional buy-in in terms of building rapport with students and making lessons meaningful and relevant. In

addition, almost all participants stated using differentiated approaches to reach their students, often using a project-based, inquiry-based, or experiential approach. Barriers to a more ideal teaching environment included only logistical challenges with lack of time and standards and testing as the top challenges. As school culture seemed to play a major role in how these educators incorporate their ideal teaching environments, the participants still overcame several challenges to include aspects of environmental education within their classroom, including approaches to experiential education, inquiry-based teaching, and social learning. Every participant could define environmental education with confidence, with terms such as awareness, observation, and/or human connections outlined in their definitions. When it came to realizing their personal definition within their classrooms, only one participant stated that he/she is teaching environmental education on a daily basis. Most incorporated environmental education through units or side conversations with students. Each participant directly attributed learning various teaching methods through the Wolf Ridge Student Teacher Program, whether through experiential education or through the importance of social learning. Likewise, a comfort in teaching not just outside, but overall, was another common theme to emerge. And lastly, the theme of participants' shifts in outlook on education with some shifting either away or towards the formal education field was determined.

Personal philosophies and past experiences have contributed to how these educators approach instructional methods utilized within the classroom daily, with the Wolf Ridge Student Teacher Program mentioned throughout the interviews by individual participants as a major influence to these approaches. Further discussion of the results with connections to prior data from the previous chapters will be included in chapter 5.

Chapter Five. Discussion

Introduction

This evaluative study sought to provide stakeholders of the Wolf Ridge Student Teacher Program (WRSTP) with information regarding impacts of the WRSTP on past participants who have since held formal teaching experience. This chapter summarizes and discusses implications of the evaluation results by research question, provides program stakeholders with recommendations for program improvement, and offers suggestions for future research.

Teaching and Work Experiences

Participant teaching and work experiences varied within the eight participants interviewed, which is in accordance with their content licensure gained after completion of the program. Grade levels varied between 2nd grade to high school, with content areas differing between science (biology, anatomy, physical science, earth science) and outside the areas of science (English Language Arts, social studies, and math). In addition, classroom numbers varied between 4 students to 30 students. Teaching experiences in assorted school types included private, public, and charter, with teaching length varying in different school types from six months to ten years. Participant backgrounds prior to entering into the WRSTP and teaching and work experiences gained afterwards were stated by participants as a major influence of teaching and education philosophies held currently. Although in many statements, specifically stated attributes of these philosophies were accredited to participation in the WRSTP (social learning, experiential learning, nature-based education, classroom formats) in addition to other past teaching experiences. This follows the findings by Flores (2005) stating, “In addition to contextual

factors, past influences that include personal history, initial teacher education programs, and teacher practices can aid in the development of current practices and behaviors in the classroom."

Overall, school culture (administrative support, colleague support, school mission, scheduling, and available funding) has played a major role in determining how these participants chose to best instruct their students. This attribute is one of the greatest challenges faced when implementing the participants' perspectives of effective learning for students, and one mentioned by both Flores (2005) and Korthagen (2003) as an important variable to consider. Interestingly, participants who have been teaching in the formal classroom for seven or more years compared to those teaching for only six months revealed that even with logistical challenges presented by school culture, such as lack of resources and support, even most participants with the lesser amount of teaching experience in the formal classroom overcame those barriers to include what they deemed as best teaching practices, including aspects of experiential and social learning.

Participant and Stakeholder Perceptions

Barriers to Environmental Education. Many in-service teachers report a lack of training in environmental education within their pre-service teacher preparation program, and therefore do not feel comfortable with the instructional methods concerning environmental education within the classroom and other settings (Disinger & Howe, 1990; Ernst, 2007, Moseley et al., 2002; Sia, 1992). Conversely, participants in the Wolf Ridge Student Teacher Program seemed confident when sharing their definition of environmental education; and shared only logistical barriers when asked why they were not realizing their personal definition of environmental education within their classroom.

These barriers included school schedule, resources, lack of connections within the state standards, and classroom space (Ernst, 2007; Ham & Sewing, 1988; Moselely et al., 2002). Not one participant reported lack of training or the confidence to teach environmental education in the formal classroom, although further study would be needed to determine confidence levels from the perspective of the participants, as this was beyond the scope of the current study.

Confidence in the Classroom. Another aspect to consider in regards to developing confidence in teaching is the length of time to practice experiential outdoor teaching methods while at Wolf Ridge ELC (over a 26-week period). In 2009, a study was conducted of a Science Methods class consisting of pre-service teachers after they were exposed to a 2-week outdoor field experience (Carrier, 2009). The first week was mainly for observation of outdoor educators who taught K-12 students visiting a Forest Ecology Preserve, and the second week the pre-service teachers conducted their own lessons with different K-12 students at the same Forest Ecology Preserve as a means to practice outdoor science methods. Carrier surveyed her students' confidence levels by assessing field journals kept by her pre-service students, and also conducted interviews seven months after the experience. The pre-service teachers mainly reported stronger confidence levels in approaching the idea of teaching outside. Within the interviews, Carrier reported that some teacher candidates stated the intention to include outdoor activities in their own classroom, while four of the fourteen participants interviewed said they had conducted outdoor lessons in other program internships.

Other programs for pre-service teacher candidates have been used to provide opportunities to learn and gain experience with teaching environmental education. For

example, the University of Minnesota-Duluth (UMD) also offers a 3-day trip to Wolf Ridge ELC within their science methods course as a means to expose pre-service teachers to non-formal outdoor teaching methods. Similarly, Eastern Kentucky University also offers a 12-hour endorsement program in environmental education to pre-service candidates, with a course that includes Teaching in the Outdoors (EKU, 2016). Participants within these shorter term programs have not been evaluated in regards to their teaching methods either in the outdoors or for the inclusion of environmental education into their formal classroom after completion of the program.

This was the first evaluative study conducted of participants after completion of this kind of lengthy student teaching program. Due to the length of time to practice experiential outdoor teaching methods while at Wolf Ridge ELC (over a 26-week period), it appeared that this added experience might have contributed to that theme. Seven of the eight participants stated taking their students outside and most wished to do it more frequently. "Future research should include longitudinal studies that begin with pre-service teachers' experiences in science methods courses, soliciting their expressed intentions of including outdoor lessons that then follow them into the classroom to document their actual practices with their students" (Carrier, 2009, p. 44). In summary, further study is needed to fully understand the implications of program length on confidence levels to not only teach in the outdoor setting, but in using teaching methods to integrate environmental education into the formal classroom.

Comparing to Stakeholder Beliefs. Although the level of confidence was not formally assessed within the study, participants did share their meaning of environmental education, and ensured that their students had opportunities to go outside. And in other

areas of their classroom, each participant demonstrated confidence in executing their personal teaching practices. Even Ellie who had been in the classroom for only six months revised her curriculum to be more project-based and group-oriented, stating:

> ...some people learn when they touch, and some people learn when they write and then they color, and so just trying to understand that everyone in your class is coming from a different place and that there are all different types of learners.

Comparing this statement to Kelly's statement in reference to reaching different learners, who had been teaching for 10 years, "The challenge though really comes in figuring out what to do with the students that aren't picking up on stuff as much. But it should be. Or getting those students that don't see value in school to see value and start doing something." This aligns to a comment made by WRSTP stakeholder, Joe Walewski, stating that many participants "do not always follow the rules" and eventually act upon what they deem as successful teaching practices. "For some it may be several years of their own personal experience before eventually their teaching practices mature and evolve to be the most successful" (2015). Walewski also believes that student teachers leave the program with the ability to tell more meaningful stories, making connections across subjects through this skill. "I think that rather than just saying the facts louder, or more often, I think that these teachers routinely depend upon story and it starts to become a habit for them" (2015). Although it was difficult for the evaluator to determine if this was a reality for the participants, elements of this statement arose in pieces within the interviews, and most often in reference to building rapport with students (making connections beyond the classroom, using student stories as examples to enhance the lesson, building social bonds between students through personal story). For example,

when Richard would reference his own students in his stories to enhance his lessons more:

> I used to try to throw a kid into my story from the class and then I'd have them own a business and they sell something ridiculous like he had Yeti food, spaghetti or something because you want something that sticks with them, better that way. So, it makes it concrete in a weird sort of way, but also, you know, being ridiculous also makes it stick.

He also went on to explain his rationale:

> Because I've seen it work for me, and I've seen it work for other people. And a lot of the time, I think a lot of people relate things in their memory to the stories. So, if they have a story to tell about something, that's something that they remember.

In addition, WRSTP stakeholder Kevin Zak "believes the program is providing the experience and skills to connect methods used between the non-formal and formal settings," including a general shift from teacher-directed approaches to more student-directed approaches. Every participant referenced using elements of student-directed approaches daily within their classroom through small-group learning, project-based learning, inquiry-based learning, and experiential learning. Tim directly referenced inquiry-based teaching as a main method of his classroom, while Michelle attested to experiential learning as her preferred style of teaching as "That's the kind of learning that really cuts to the core." Small-group learning, inquiry-based learning, and experiential learning correlate with the teaching philosophy of the Wolf Ridge Environmental Learning Center.

It is important to note that several participants explicitly stated having troubles making connections between the formal and non-formal settings while participating in the WRSTP. This is extremely important as the goal of the WRSTP "aims to develop quality formal educators that understand how to bridge the current gap between formal and non-formal classroom settings and are dedicated to being leaders in their communities" (WRSTP, 2004, pg. 1). Both Richard and Kelly referenced feeling the formal and non-formal experience as two separate experiences, rather than a blending of both. Kelly states, "I think that for me the most challenging piece for my student teaching experience was in the classroom portion and not having a lot of connection between the classroom and the Wolf Ridge pieces and sort of being on an island by myself during that formal classroom time." Following that same vein, Richard reported, "So, it's almost like I got trained as an environmental educator, and trained as a traditional educator, but without somebody else who already was doing that, I think it's hard to blend the two. And I kind of feel like it was still two different experiences and not one experience that made that connection." Interestingly though as Kelly explains feeling on an island, she adds,

> …having been at Wolf Ridge and having had several different types of learning environments from the classroom, to outside and to the external piece and classroom piece of my student teaching as well, opened up the idea that learning can and should be taking place everywhere whether it is inside or outside or whether it is within the walls of a classroom, whether it is on the athletic field, you know whether it is out in a school forest whether it is in homes at night, learning is sudden and can be happening, in all aspects of a student's life.

Richard also references building his "teaching toolbox" over the years in regards to creating an environment of active engagement for his students. Both of these statements indicate that although bridging the gap between non-formal and formal classroom settings during their student teaching experience was initially hard, over the course of their teaching experience, they have come to value their exposure to the learning environment offered at Wolf Ridge.

Ultimately, Walewski believes the Wolf Ridge Student Teacher Program "broadens people's perspective on what education can be. I think we've just given them a broader perspective on what's possible" (2015). A theme that arose unexpectedly in the evaluation was the theme of shifting outlooks on education. Through delving into past work experiences, it was found that several participants actively pursued teaching positions outside the formal education field, while one participant was drawn closer to the teaching within the formal education field. This evaluation does not include the WRSTP participants who never pursued a career in the formal education field after gaining licensure, nor does it include those that entered into the Naturalist Training Program and now hold a formal teaching position. More research is needed to study why these shifts are occurring and if it can aid in program improvement of the WRSTP.

Effective Learning and Teaching Method Approaches

Overall, the two main themes guiding participant philosophies of effective learning and teaching practices were social and emotional buy-in (building rapport and meaningful learning) and using different approaches for different learners (incorporating technology, project-based education, social learning, hands-on, experiential learning, inquiry-based learning). Many expressed their skills and confidence to pursue what they

felt was the most effective learning for their students despite overall school culture. Fostering these social connections and empowering students was a strong value among every participant, whether student-to-student, or teacher to student, which aligns with one of the guiding principles for environmental education (UNESCO, 1977).

Even the characteristics of ideal teaching environments (better access to the outside, more classroom space, project-based education, interdisciplinary connections, teacher independence, and time for meaningful learning) as stated by participants, aligned with these guiding principles for environmental education. And the barriers (lack of time, standards and testing, liability and safety, funding, small classroom space) did not reflect the conceptual barriers (lack of knowledge and training) listed by Ham and Sewing (1988). Of the few who are not realizing the content of environmental education in their curriculum, when directly asked, those participants stated time and connections within the curriculum as an inhibitor. But every participant reported realizing experiential and social learning within the topics they teach, which are two major aspects of environmental education. Figure 4 connects back to the four approaches to incorporating environmental education as it applies to the eight participants and their methods for incorporating environmental education into their teaching (EETAP, 2004).

Both school culture and individual characteristics like tenacity and desire (Flores, 2005; Korthagen, 2003) play a major role in the incorporation of environmental education. Because Michelle has the ability to teach in a school were environmental education is built into the purpose and mission, her classroom reflects this philosophy and she integrates her subjects under this approach of framing. Sarah

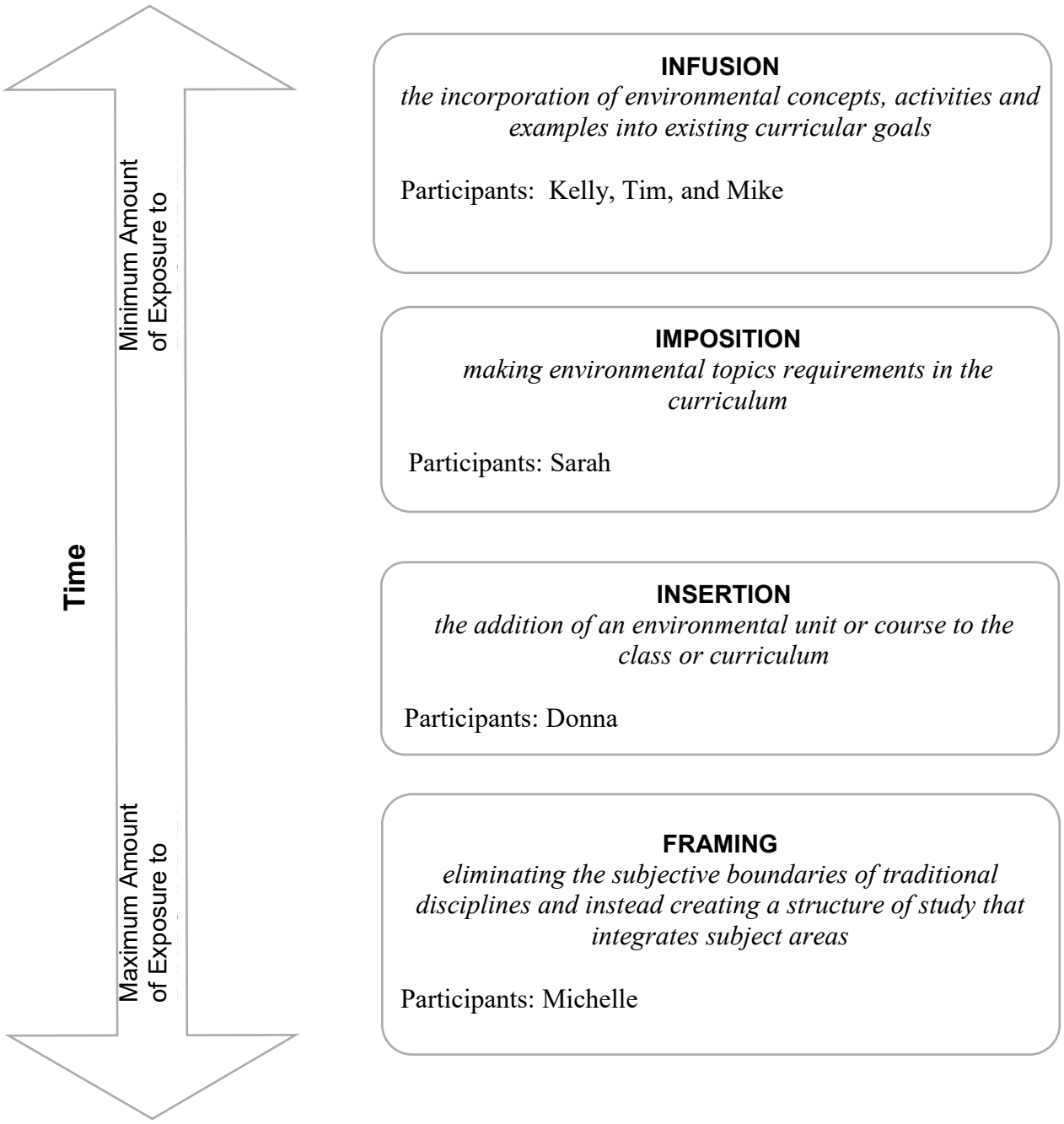

Figure 4: The four approaches to environmental education as it applies to the participants interviewed. Not all participants are labeled as few said they did not realize environmental education as it relates to teaching purely the knowledge of environmental education within their classrooms. It is important to note that all participants taught aspects of the skills and attitudes of environmental education within their classroom. (Adapted from EETAP, 2004)

Uses imposition to incorporate environmental topics (school gardening, nutrition lessons, animal adaptations) into her classroom even without support from her colleagues. Donna teaches a unit on ecology and recycling that she chose to include within her curriculum which exemplifies the insertion approach. Most participants realized environmental education through infusion, as evidenced in their use of side conversations and activities, although that is not to say that they did not realize it through teaching the skills and attitudes of environmental education. This figure applies only to the knowledge domain of environmental education, and not necessarily the skills and attitudes.

Advocates of WRSTP Program Components

Wolf Ridge ELC approaches environmental education from a perspective that seeks to improve visiting students' attitudes and behaviors regarding: environmental responsibility; personal development; social development; and leadership. Correspondingly, Wolf Ridge's mission statement is "To develop a citizenry that has the knowledge, skills, motivation and commitment to work together for a quality community" (Wolf Ridge ELC, 2013). Participants have advocated for use of the program by incorporating their philosophies of effective learning (experiential learning and social learning) into their class formats and curriculum. Interestingly, teaching outside is another program component that some participants have utilized when exposing their students to a new concept, with six of the eight having reported using the outdoors as a means to teach a topic (throwing boiling water during winter to demonstrate change in matter, taking weather observations, physically drawing the protestant and catholic schism through a map) or for the pure enjoyment and social bonding aspect.

Several participants have created additional classes or committees to bring the outdoors in to the school setting. For example, Kelly has taken her experiences a step further in organizing and creating the School Forest Committee at her high school. Similarly, Mike created an outdoor walking time to illicit more social development within his class. These serve as examples of advocating for use of program components, specifically in terms of leadership.

Recommendations for Program Improvement

As this was a utilization-focused developmental evaluation (Patton, 1997; Patton 2011), the following are recommendations for stakeholders of the Wolf Ridge Student Teacher Program to be used for program improvement and development.

Greater connections between formal and non-formal classroom settings. Some of the participants interviewed offered insights into the improvement of the WRSTP through the strengthening of the connections to teaching within the formal classroom setting while at Wolf Ridge Environmental Learning Center. If the program goal is to "develop quality formal educators that understand how to bridge the current gap between formal and non-formal classroom settings and are dedicated to being leaders in their communities" (WRSTP, 2004, pg. 1), then a major focus should be placed on small changes to enhance this major aim of the program. In addition, the evaluator also contributed her insights regarding two aspects of program improvement based upon analysis of interviews. These included:

More Opportunities for More Experience in Formal Teaching Settings. Two of the participants stated they would have preferred to experience more formal education settings, specifically those of the visiting schools or schools nearby. The way a teacher

may teach is largely influenced by several contextual factors, including leadership within school culture (Flores, 2005), and therefore constructing effective professional development opportunities is key (Riordan & Klein, 2010). Being exposed to more experiences in the formal classroom may lead student teachers to find the comfort needed to bridge that gap between formal and non-formal education settings. As both Richard and Kelly commented on feeling disconnected between the separate teaching experiences during their time as a student teacher, more experiences in formal classroom settings where environmental education takes place can contribute to lessening that feeling of disconnect in teaching approaches. According to NCATE standards on effective field and clinical practice,

> Field experiences facilitate candidates' development as professional educators by providing opportunities for candidates to observe in schools and other agencies, tutor students, participate in education-related community events, interact with families of students, attend school board meetings, and assist teachers or other school professionals prior to clinical practice. (NCATE, 2016)

CAEP also outlines teacher preparation program standards, stating

> The provider [in this case, WRSTP] works with partners to design clinical experiences of sufficient depth, breadth, diversity, coherence, and duration to ensure that candidates demonstrate their developing effectiveness and positive impact on all students' learning and development. (CAEP, 2016)

A recent study in 2015, researched different methods used in preparing Wisconsin teacher candidates to teach K-12 students about the environment (Ashmann & Franzen, 2015). After surveying over 33 pre-service programs, 5 programs 'stood out' when it

came to preparing teacher candidates to teach environmental education. Each of these programs showed stronger preferences in providing the materials, human, and social resources. “Curriculum materials, field trip sites, community-based resources are prominent material resources while knowledgeable instructors, interested students, individual commitments are key human resources in the stories of these teacher education programs” (2015). The purpose for many of the teacher education programs surveyed in this study was to “help teacher candidates better understand the resources available to them as they teach primary or secondary students about the environment” (2015). Thus, the purpose of the field-trip excursions for the student teachers of the WRSTP to different formal classroom settings would serve to provide them with perspectives on how different formal classroom teachers who have been teaching for an extended period integrate environmental education into their formal classroom.

Assessments. Assessment within non-formal education is lacking in general, although as one participant stated, “I think that that’s something that every non-formal setting will struggle with for all of time.” But student assessment by the pre-service candidates should occur as WRSTP is defined as a “provider” by NCATE/CAEP, and “Providers ensure that candidates apply content and pedagogical knowledge as reflected in outcome assessments in response to standards of Specialized Professional Associations (SPA)” (CAEP, 2016). As NAAEE was categorized as an SPA, the guidelines set by the *Standards for the Initial Preparation of Environmental Educators* and followed by WRSTP should be upheld. In fact, Standard 6 is in direct regard to assessment stating:

> *Candidates understand and value assessment as an indispensable part of successful curriculum development and instruction. They know that if assessment*

> *is to be successful, it must be planned and implemented on a continuing basis. They recognize the difference between formative and summative assessment and how each can be used to improve instruction to meet the needs of diverse students. They view assessment as an effective component of instructional improvement and use assessment to select developmentally appropriate goals and objectives, teaching strategies, and curricular resources* (NAAEE, 2007, p. 16).

There is a shift towards more practice in assessment within the environmental education field overall. "Through changes in its accreditation process and the formulation of standards based on systemic assessment and performance-based learning, NCATE aims to shift practices in mainstream education to those that best help students apply knowledge, reason analytically, and solve problems" (Archie, 2005, p.7). Assessment practices should also reflect national and state standards, as candidates should also "thoroughly critique a wide range of environmental education instruction materials, resources, technologies, and settings, employing criteria such as national, state and local content standards" (NAAEE, 2007, p. 14). These guidelines could serve WRSTP and its participants in gaining more strength in helping participants develop stronger assessment practices. Several participants stated assessment as a weak point of the program; Mike stated that he'd prefer a closer look at "the assessment of what kind of learning happens within that setting." Assessment can happen informally and can create a good connector piece between the formal and non-formal world. Assessment in the form of concept maps, diagrams, student-created models, and a shift towards performance-based assessments can give student teachers a variety of assessment methods enriching experiential learning or social learning (Archie, 2005). Student teachers can also use

these strategies within their 10-week formal education placements as a way to connect teaching methods, providing a stronger link to bridging the gap between the formal and non-formal education setting.

Further Research

The findings from this evaluation are an important starting point toward understanding the influence of the Wolf Ridge Student Teacher Program. Many future studies can add to the knowledge gained about this particular teacher training program and the effectiveness of such programs. The following are suggestions related to future research of the Wolf Ridge Student Teacher Program:

- *Compare results to other possible longitudinal studies.* In both studies of several other teacher education programs (Ashmann & Franzen 2015; Carrier, 2009), a call for longitudinal studies surveying graduates after program completion was mentioned. If these longitudinal studies do occur, comparing the results of this study to results of programs of shorter length would give great insight into the question how of much time is needed for effective learning of environmental education methods.
- *Interview participants who never entered the formal education field.* This evaluation did not seek those that pursued other careers outside of the field of formal education, even after gaining initial teacher licensure. As one of the themes that emerged involved participants shifting views of formal and non-formal education, it would be valuable to know what drove those participants to other career choices and reasons for making such choices. This could aid in furthering ways to support participants in meeting program outcomes.

- *Widen scope of research.* The Wolf Ridge Naturalist Training Program offers training within a non-formal training setting only. Yet, many naturalists completing this program have chosen careers within the formal education field after program completion. Notably, one participant specifically mentioned that the number of naturalist program participants in teaching positions outweighs the number of student teacher participants, and conducting interviews similar to this evaluative study with that population would be beneficial to the WRSTP.
- *Survey students, principals, or colleagues of program participants.* This evaluation is based on self-reporting from past program participants. It is not generalizable beyond this study. Creating a survey that evaluates the audiences directly connected to program participants and comparing results to those who did not attend the program could contribute to provide additional perspectives on the effectiveness of the WRSTP. This information could be used to define proponents that contribute to an effective teacher-training program.
- *Assess other program outcomes.* This evaluation centered on instructional methods and potential challenges to making connections to environmental education through use of the outdoors or within the classroom. It did not focus on past participant leadership within the school and surrounding community, which was another medium-term outcome of the Wolf Ridge Student Teacher Program Logic Model. Therefore, to offer more extensive feedback for the stakeholders of the Wolf Ridge Student Teacher Program, the evaluator recommends further research within this domain, as well as research into the long-term impacts of the program from past participant perspective.

Conclusion

In this study, eight past participants of the Wolf Ridge Student Teacher Program were interviewed to find out program impacts as it applies to their formal classrooms today. It was found that participants most often relied on aspects of environmental education, including experiential learning and social learning, within their classrooms, both of which are major program components of the Wolf Ridge Student Teacher Program. In addition, school culture played a major role in how these teachers use these program components, including administrative support, colleague support, and time. Often the logistical challenges of school culture, which included time, standards and testing, liability, and funding, hindered the inclusion of these aspects of environmental education. Fortunately, past program participants overcame many of the logistical challenges and implemented what they deemed best for effective learning for their students. The conceptual challenges of lack of understanding and lack of confidence did not appear in the interviews, which is a major success to document for this particular program model. An unforeseen impact was the shifting outlooks of education, specifically regarding the entrance into formal education after gaining licensure or pursuing other career options in the field of non-formal education.

After reviewing the Wolf Ridge Student Teacher Program Logic Model (See Appendix C), the evaluator has determined that the medium-term outcome that was solely assessed within this evaluation is being achieved according to this study:

> Teachers use skills, experiences, and knowledge gained to provide more opportunities to connect students to outdoors and within classrooms, using wider range of instructional methods.

This evaluation provides feedback to the stakeholders of the Wolf Ridge Student Teacher Program in terms of instructional methods used by past participants within their formal classrooms. Patterns emerged in the use of social, experiential, and inquiry-based learning to connect students to the curriculum material that was taught. Several participants attributed their influence of these methods to their participation in the Wolf Ridge Student Teacher Program. As it related to connecting students to the outdoors, most participants reported taking their students outside, although the level of connection to the outdoors varied based on school culture and logistical challenges, but not by lack of confidence or training as many other in-service teachers have reported in other studies (Disinger & Howe, 1990; Ernst, 2007; Lane, 1994; Moseley et al., 2002; Sia, 1992).

The Wolf Ridge Student Teacher Program offers a valuable experience in the introduction of different teaching methods and strategies that is not common in a more traditional university teacher-training program. Improvements are encouraged in making stronger connections between non-formal and formal education settings, such as providing the student teachers with more opportunities to visit formal classrooms that integrate components of environmental education, and the inclusion of more assessment practices. Overall, this evaluation documents that the program strengthens the confidence of participants to incorporate what they feel are the best forms of student learning within their classrooms.

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Appendices

Appendix A
Wolf Ridge Student Teacher Program Flyer

Student Teaching Program at Wolf Ridge






The mission of this program is to provide pre-service teachers experience teaching in and out of the classroom. The program works under the assumption posed by David Orr – "All education is environmental education. By what is included or excluded, students are taught that they are part of, or apart from the natural world."

By teaching in both settings, these future teachers learn how to bring the outdoors into their classroom curriculum and how to bring their classroom outdoors, providing their students with opportunities to connect their learning to the natural world. The program aims to develop quality formal educators that understand how to bridge the current gap between formal and non-formal classroom settings and are dedicated to being leaders in their communities.

Unlike most student teaching experiences, the Student Teacher Program at Wolf Ridge encompasses an entire academic year. Student teachers begin the year by spending two full weeks learning and experiencing environmental education at a residential environmental learning center. They learn in community with professional staff, sixteen graduate students and other student teachers. During the academic year, student teachers teach a total of twenty-six weeks at an environmental learning center, providing environmental education instruction to approximately 2,500 students aged kindergarten through college, with the majority of students in grades 5-8. During the middle of the academic year, student teachers spend ten consecutive weeks in a formal classroom working with a mentor teacher in their content licensure area.

Established in 2004, the Student Teacher Program at Wolf Ridge has averaged two student teachers a year. Currently, there are three student teachers participating in the program. Past participants have gone on to serve in leadership roles in their schools and the environmental education community.

Training Includes:

Animal Signs
Beavers
Birds
Small Mammals
Showshow Hare
White-tailed Deer
Wildlife Management
Forest Ecology
Trees and Keys
Wetlands Ecology
Lake Study
Stream Study
Fisheries Management
Frozen Lake Study
Geology
Weather Forecasting
Acid Rain
Climate Change - Ecology
Climate Change - Energy
Seeds of Change
Ojibwe Heritage
Ojibwe Snowshoe
Voyageur Life
Adventure Ropes
Rock Climbing
Basic Survival
Initiative Games
Beginning Orienteering
Competitive Orienteering
Canoeing
Cross-country Skiing
Snowshoeing
Superior View Hike
Earth Works
Astronomy
Block Printing
Campfir
Dream Catchers
Night Hike
Owl Pellets
Paper Making
Star Lab
Woodland Art
Bats
Fur Trade
History of North Shore
Logging Camp Life
Moose
Raptors
Wolves

Instruction Techniques
Storytelling
Curriculum Development
Motivational Skills
Brain-based Learning
Special Audiences
Processing Experiences
Nature Journalling
Questioning Techniques
Group Management
Experiential Learning

Joe Walewski
Director of Naturalist Training
Wolf Ridge ELC
Finland, Minnesota
joe.walewski@wolf-ridge.org

Kevin Zak
Instructor, Dept. of Education
University of MN Duluth
Duluth, Minnesota
kzak@d.umn.edu

Appendix B
Wolf Ridge Environmental Literacy Competency Manual:
Environmental Educator Literacy

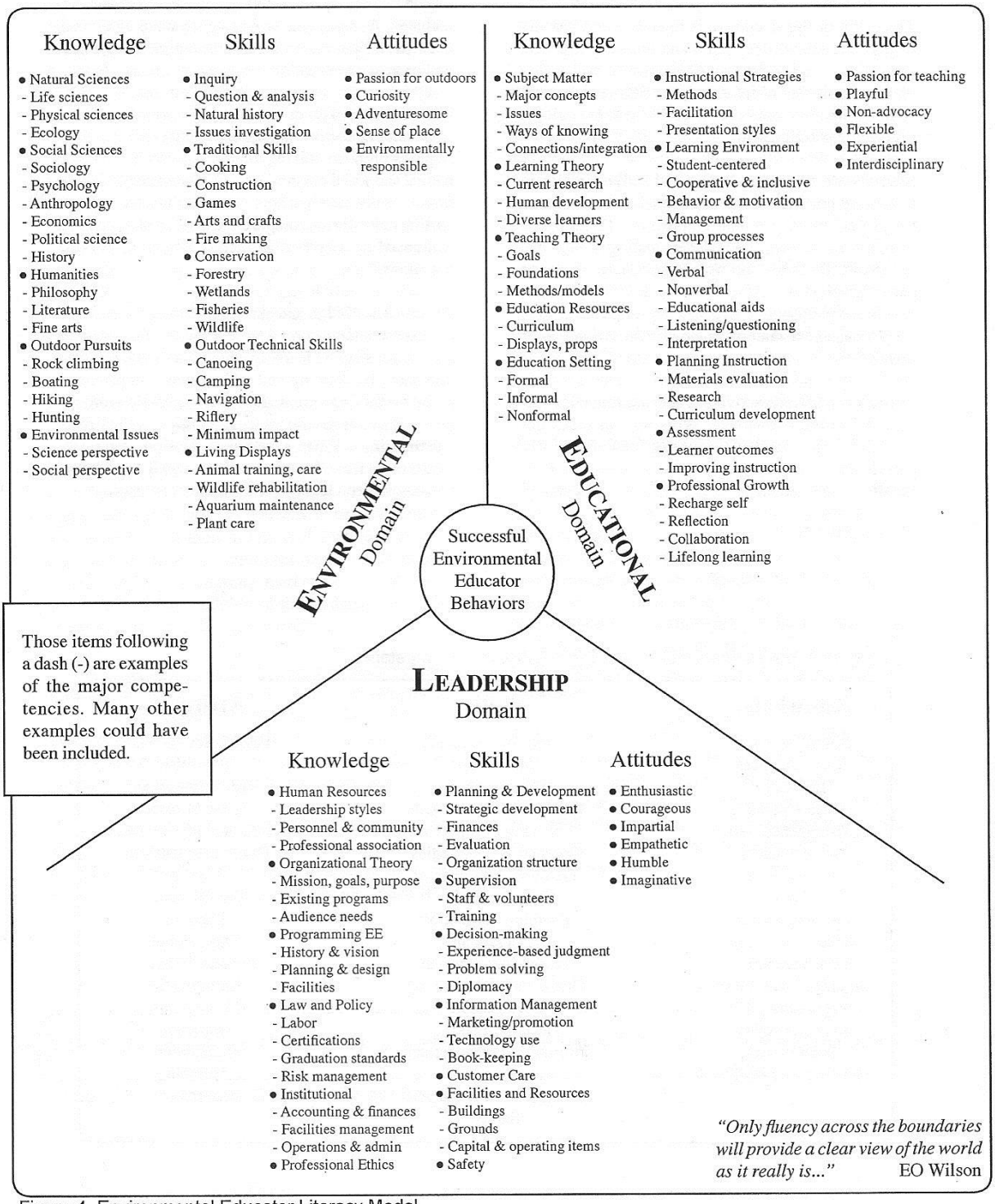

Figure 4. Environmental Educator Literacy Model

Appendix C
Wolf Ridge Student Teacher Program Logic Model

Wolf Ridge Student Teacher Program Logic Model						
Situation	Inputs	Outputs		Outcomes		
(Identifies need which originally gave rise to the program)	What we invest	Activities: What we provide	Participation: Who we reach	Short Term: Learning (1 academic year)	Medium Term: Action (1-3 years with classroom)	Long Term: Impact (3+ years)
•Bridge gap between formal and non-formal education settings through formal educators •Harness different teaching strategies (i.e. experiential education) to apply to formal and non-formal education settings •Develop a greater confidence to connect students with the outdoors •Build a greater awareness and understanding of the field of environmental education as an educator	•Time •Staff •*Joe Walewski* (coordinates with university administration, organizes 26 weeks of teaching at Wolf Ridge, and promotes program) •*Program Staff at Wolf Ridge* (provides support and perspective for incoming naturalists and student teachers) •*20 naturalists* (provides community and support to fellow educators) •Staff Housing •Use of equipment and facilities •Participating universities	•20 weeks teaching at Wolf Ridge ELC, 6-8 classes per week within an outdoor non-formal education setting •6-7 liaisonships per year between Wolf Ridge ELC and visiting schools •10-15 weeks teaching at Placement School within a formal education setting •4 evaluations of non-formal education teaching via Joe Walewski with feedback on teaching strategies • 2 evaluations of formal education and 2 non-formal education evaluations via Kevin Zak with feedback on teaching strategies •Support for student teachers: 2 weeks of training with additional training throughout year, comprehensive lesson plans and curriculum provided, additional assistance provided via staff •Opportunities to grow understanding and awareness as a naturalist and environmental educator via weekly seminars and excursions outside of Wolf Ridge	•Student Teachers participating in the Wolf Ridge Student Teaching Program •Visiting schools to Wolf Ridge ELC •Schools chosen as Placement Schools; also included are Cooperating Teachers, students, administration, and teaching staff	•Develop greater awareness and confidence of teaching methods within experiential education practiced throughout 10 months •Increase motivation to learn the natural history of a particular area and share within a classroom or community setting •Increase ability to teach awareness of natural environment, the human relationship within, and stewardship	•Influence school or organization processes through leadership within school system •Teachers use skills, experiences, and knowledge gained to provide more opportunities to connect students to outdoors and within classrooms, using wider range of instructional methods •Partnerships between teacher, community, and outside organizations form to promote environmental education within the classroom	•Foster leadership skills within learning community •Become integral community members within schools and organizations, influencing processes to develop stronger commitment to environment

Appendix D
Participant Interview Guide

INTERVIEW GUIDE

The following research questions were used in formatting and sequencing the interview questions:

Research Question #1: What teaching and working experiences have past participants held since leaving the Wolf Ridge Student Teacher Program?

Research Question #2: How do past participant perceptions on program outcomes of the Wolf Ridge Student Teacher Program compare with stakeholder perceptions?

Research Question #3: How does the experience of participation in the Wolf Ridge Student Teacher Program influence participant perspectives as they relate to educational elements that include the learning environment, curriculum, teaching practices, and perceptions of environmental education?

Research Question #4: How have participants used or advocated for the use of program components within their formal classroom experiences?

Interview questions and question sequence are as follows:

1) How long have you taught as a classroom teacher in the formal school setting?

2) Where have you worked since gaining your Minnesota teacher licensure? Please give enough detail so I could picture the environment of your workplace(s) and your role within that environment.

3) Where are you working currently?
   a) Please describe your current role and your responsibilities within that role.

4) Describe a typical day in your classroom [as it relates to your experience as a formal educator] as it relates to your school, your schedule, and your students.
   a) Why do [did] you follow this format?
   b) Tell me about your classroom. Tell me about your students.

5) What topics do [did] you focus on most within your lessons and units?
   a) When teaching any of these topics, do [did] you take students outside?
   b) How are students learning and what are they doing to learn?

6) What makes for effective learning?
   a) How did you come to know that?
   b) Share an example from your teaching experience.

7) Share a story where you've felt most fulfilled as an educator in your position.
   a) What influenced that moment?

8) What does [did] your ideal learning environment look like? In other words, if you could create any ideal teaching and learning situation, what would it look like?
    a) What components do you feel are necessary when describing your ideal learning environment?

9) How does your picture of your ideal learning environment compare with the picture of your current [past] teaching situation? As it pertains to the curriculum? As it pertains to your instructional methods?
    a) What challenges do you face when attempting to make this ideal picture a reality?
        i) Why do you consider these challenges?

10) Now I would like to shift the focus from your classroom experiences to your thoughts on environmental education by first exploring your definition of environmental education. How would you define environmental education?
    a) Do you feel environmental education is an important component within the curriculum?
        i) Why or why not?
    b) Do you see yourself realizing your definition of environmental education within your teaching situation? Why or why not?

11) Regarding those topics or units within your curriculum, and your definition of environmental education, please share some examples that relate to your teaching situation and where environmental education may occur.

12) Now I would like to explore your perceptions of the Wolf Ridge Student Teaching Program by asking a few questions regarding your experience. Reflecting back on your experience in the Wolf Ridge Student Teacher Program, were there some defining moments of growth that stand out to you as it pertains to your personal growth? As it pertains to your professional growth?
    a) Why do these moments of growth stand out in your mind?

13) What are your biggest educational take-aways from your experience in the Wolf Ridge Student Teacher Program, specifically regarding instructional methods, curriculum, and the learning environment?
    a) Why do you consider these educational take-aways of the Wolf Ridge Student Teacher Program?
    b) Within your experience at Wolf Ridge, what did you learn about concerning educational settings?
    c) In your opinion, what do you feel was missing from your experience at Wolf Ridge?

14) Thank you for your time and contribution throughout this interview. If you feel I have missed a question, or an important point within this conversation, please feel free to contribute that information. Is there anything else you wish to add to this interview before we conclude?

Appendix E
Initial Contact Email

Subject Line: Participants Sought for a Research Study of the Wolf Ridge Student Teacher Program and Perspectives of the Formal Classroom

Hello!

As a current graduate student of the University of Minnesota – Duluth, I am seeking participants for my research study of past participant perspectives of the Wolf Ridge Student Teacher Program and the formal classroom. You are receiving this email because of your past participation in the Wolf Ridge Student Teacher Program, and your current or past experience as a formal educator. Your email address was obtained from a participant database list provided by the Wolf Ridge Director of Naturalist Training, Joe Walewski.

This study is about the current perceptions of formal educators as it relates to classroom practices and teaching strategies after completion of the Wolf Ridge Student Teacher Program. The purpose of this study is to evaluate the program outcomes of the Wolf Ridge Student Teacher Program, and explore the potential relation to teaching practices within the formal classroom. Through the sharing of your classroom stories, I hope to identify information that will be beneficial to guiding the Wolf Ridge Student Teacher Program.

If you choose to take part in this study, you will be asked to participate in one interview via Skype. I will arrange a time convenient for you through email. The interview will last approximately 40 to 50 minutes, and will be audio recorded and transcribed.

Your participation is this study is completely voluntary. This means you do not have to participate if you do not want to. If you agree to participate, you have the right to answer only the questions you choose to answer. The potential risks of this research are minimal and all information you provide will be kept private and made available only to me as the principal investigator. You will not be compensated for your participation in this study. You have the right to stop participation at any point during the Skype interview if you so choose.

If you choose to participate in the study, or have any questions about the study, please email Mary Beth Factor, at facto007@d.umn.edu or call (314) 229 – 4116.

Thank you for your consideration. Your information will provide valuable feedback concerning perspectives on the Wolf Ridge Student Teacher Program.

Sincerely,

Mary Beth

Appendix F
Participant Consent Information Sheet

University of Minnesota

Duluth Campus

Department of Education

College of Education and Human Service Professions

Education Endazhi-gikinoo'amaading
412 Library Drive
Duluth, Minnesota 55812-3029

Office: 218-726-7233
Fax: 218-726-7008
www.d.umn.edu/educ/
Email: educ@d.umn.edu

INFORMATION SHEET FOR RESEARCH

Wolf Ridge Student Teacher Program Participants' Perspectives of the Formal Classroom

You are invited to participate in a research study investigating the current perceptions of formal educators on classroom practices and teaching strategies after completion of the Wolf Ridge Student Teacher Program. You were selected as a possible participant due to your past participation in the Wolf Ridge Student Teacher Program, and your current or past experience as a formal educator. Please read this form and ask any questions you may have before agreeing to participate in this study.

This study is being conducted by the principal investigator, Mary Beth Factor, a Masters of environmental education Candidate in the Graduate School of the University of Minnesota Duluth.

Background Information

The purpose of this study is to evaluate the program outcomes of the Wolf Ridge Student Teacher Program, and explore the potential relation to teaching practices within the formal classroom. By investigating past participant perspectives of teaching within a formal classroom, this study will help identify possible patterns of experiences as they relate to the Wolf Ridge Student Teacher Program.

Procedures

If you agree to this study, you will be asked to participate in one interview via Skype. The principal investigator will arrange a time convenient for you through email. The interview will last approximately 40 to 50 minutes, and will be audio recorded and transcribed into a word processor following the interview. To establish validity within the study, you will receive a print out of the transcripts via email and be asked to verify your comments.

Risks or Benefits of being in the Study

There are no foreseeable risks or benefits for participation in this study.

Compensation

There is no compensation for participation in this study.

Confidentiality

The records of this study will be kept private and the interview data will be available only to Mary Beth Factor, the principal investigator. Quotes from this interview may appear within the final research report, but under no circumstances will your name or identifying characteristics be included in this report. You will be assigned a random identifier within the report. The report will not include any information that will make it possible to identify you as a participant. Research records will be stored securely and only the principal investigator will have access to the records.

Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with your school, colleagues, or past administrators; nor will your past or current relationships with Wolf Ridge Environmental Learning Center staff be affected. If you decide to participate, you may refuse to answer any question or withdraw from the interview at any time.

Contact and Questions

You may ask any questions you have now. If you have any questions later, **you are encouraged** to contact either the principal investigator or her advisor at:

Mary Beth Factor
Principal Investigator
Masters Candidate, UMD
Phone: 314-229-4116
Email: facto007@d.umn.edu

Dr. Kevin Zak
Advisor
Assistant Professor, UMD Education
Phone: 218-726-6821
Email: kzak@d.umn.edu

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this form to keep for your records.